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MASTER Implementation Plan
FOR The MARINE CORP Field Logistics SYS

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MASTER IMPLEMENTATION PLAN

FOR THE

MARINE CORPS FIELD LOGISTICS SYSTEM

FINAL REPORT

DECEMBER 1980

MASTER IMPLEMENTATION PLAN

FOR THE

MARINE CORPS FIELD LOGISTICS SYSTEM

Final Report

December 1980

Prepared under
U.S. Marine Corps
Contract No. M00027-80-G-0031

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CONTENTS

TABLE

GLOSSARY

AAFS	Amphibious Assault Fuel System
ABFC	Advanced Base Functional Component
ACG	Acquisition Coordinating Group
ACI	Allocated Configuration Identification
ACO	Administrative Contracting Officer
AE	Assault Echelon
AFOE	Assault Follow-On Echelon
ALAS	Advanced Logistic Analysis Study
ALO	Advanced Logistic Order
ALSA	Amphibious Logistics Support Ashore
AMSDL	Acquisition Management System and Data Requirements Control List
AMSS	Advanced Multipurpose Surfacing System
ANSI	American National Standards Institute
AOA	Amphibious Objective Area
APO	Acquisition Project Officer
APS	Acquisition Program Sponsor
ASA	Appropriation Stores Account
ASC	Automated Service Center
ASPO	Acquisition Sponsor Project Officer
BSA	Beach Support Area
C^3	Command, Control, and Communications
CCB	Configuration Control Board
CCRB	Course Content Review Board
CDRL	Contract Data Requirements List
CE	Cost-Effectiveness
CEL	Civil Engineering Laboratory, Port Hueneme, California
CFE	Contractor-Furnished Equipment
CFS	Contract Field Services
CI	Configuration Item

CLABU	Combined Laundry and Bath Unit
CM	Configuration Management
CONUS	Continental United States
COTS	Container Offloading and Transfer System
CPM	Critical Path Method
C&RO	Concepts and Requirements Office
CRS	Cable Reinforcing Set
CSA	Configuration Status Accounting
CSSA	Combat Service Support Area
CVM	Conceptual Vehicle Mix
DID	Data Item Description
DM	Data Management
DMO	Data Management Officer
DPO	Development Project Officer
DRRB	Data Requirements Review Board
DT	Development Test
EAF	Expeditionary Airfield
ECP	Engineering Change Proposal
EENT	Eye, Ear, Nose and Throat
EMC	Electronic Maintenance Complex
EMI	Electromagnetic Interference
EOD	Explosive Ordnance Disposal
FCI	Functional Configuration Identification
FLS	Field Logistics System
FMF	Fleet Marine Force
FSSG	Force Service Support Group
FYDP	Five-Year Defense Plan
GFE	Government-Furnished Equipment
GFI	Government-Furnished Information
GFM	Government-Furnished Material
GPH	Gallons Per Hour
GPM	Gallons Per Minute
GSA	General Services Administration
HERS	Helicopter Expedient Refueling System
HLZ	Helicopter Landing Zone

HHMTT	Heavy High Mobility Tactical Truck
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HQMC	Headquarters Marine Corps
ICU	Intensive Care Unit
ILS	Integrated Logistic Support
ILSP	Integrated Logistic Support Plan
IMA	Intermediate Maintenance Activity
IO	Inventory Objective
IOC	Initial Operational Capability
IPCS	Incremental Programming Contract Schedule
IPR	In-Progress Review
ISD	Instructional Systems Development
ISO	International Organization for Standardization
ITDT	Integrated Technical Documentation and Training
JOCOTAS	Joint Committee on Tactical Shelters
KD	Knockdown
LACH	Lightweight Amphibious Container Handler
LAP	Letter of Adoption and Procurement
LASH	Lighter Aboard Ship
LCM	Landing Craft Medium
LCU	Landing Craft Utility
LEM	Logistic Element Manager
LFTC	Landing Force Training Command
LMIS	Logistics Management Information System
LOTS	Logistics-Over-The-Shore
LRS	Link Reinforcing Set
LSA	Logistic Support Analysis
MAB	Marine Amphibious Brigade
MAF	Marine Amphibious Force
MAG	Marine Air Group
MAGTF	Marine Air/Ground Task Force
MAU	Marine Ampibious Unit
MAW	Marine Aircraft Wing
MCAS	Marine Corps Air Station
MCB	Marine Corps Base

MCDEC	Marine Corps Development and Education Command
MCEMS	Environment Controlled Medical System
MCESS	Marine Corps Expeditionary Shelter System
MCLB	Marine Corps Logistics Base
MCO	Marine Corps Order
MCOTEA	Marine Corps Operational Test and Evaluation Activity
MCPR	Marine Corps Procurement Request
MEPDIS	Mobile Electric Power Distribution System
MERADCOM	Mobile Equipment Research and Development Command
MFFS	Marine Corps Field Feeding System
MGB	Medium Girder Bridge
MHE	Material Handling Equipment
MI	Modification Instruction
MILCON	Military Construction
MIL-STD	Military Standard
MIMMS	Marine Corps Integrated Maintenance Management System
MIMMS-AIS	Marine Corps Integrated Maintenance Management System-Automated Information System
MIPR	Military Interdepartmental Procurement Request
MOS	Military Occupational Specialty
MPS	Maritime Prepositioned Supplies
MSARC	Marine Corps System Acquisition Review Council
MSC	Military Sealift Command
MSD	Marine Corps Support Date
MSR	Main Service Road
MTMC	Military Traffic Management Command
MUST	Medical Unit Self-Contained Transportable
MVEE	Military Vehicles and Engineering Establishment (British)
NARADCOM	Natick Army Research and Development Command
NAVCHAPGRP	Naval Cargo Handling and Port Group
NAVFACENGCOM	Naval Facilities Engineering Command
NAVMC	Navy-Marine Corps
NCO	Noncommissioned Officer
NCOIC	Noncommissioned Officer In Charge
NLAB	Natick Laboratories
NSN	National Stock Number

NSRDC	Naval Ship Research and Development Center
NSSC	Non-Self-Sustaining Containership
NW	Nuclear Weapon
OIC	Officer in Charge
OMA	Organizational Maintenance Activity
OMMC	Operation and Maintenance, Marine Corps
OMMCR	Operation and Maintenance, Marine Corps Reserve
ORF	Operational Readiness Float
O&S	Operation and Support
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
OT	Operational Test
O&T	Operation and Training
P^3	Preservation, Packaging, and Packing
PALCON	Pallet Container
PBL	Parts Breakdown List
PCA	Physical Configuration Audit
PCI	Product Configuration Identification
PDA	Principal Development Agency
PDR	Preliminary Design Review
PHS&T	Packaging, Handling, Storage, and Transportation
PIP	Product Improvement Program
PMC	Procurement, Marine Corps
POL	Petroleum, Oil, Lubricant
POM	Program Objective Memorandum
POS	Probability of Success
PSI	Pounds per square inch
PWD	Project Work Directive
PWO	Procurement Work Order
PWR	Prepositioned War Reserve
QDR	Quality Deficiency Report
QUADCON	Quadruple Container
RDF	Rapid Deployment Force
R&M	Reliability and Maintainability
ROC	Required Operational Capability

RO-RO	Roll-on Roll-off
ROWPU	Reverse Osmosis Water Purification Unit
RTF	Rough Terrain Forklift
SASSY	Supported Activity Supply System
SATS	Short Airfield for Tactical Support
SCN	Specification Change Notice
SE	System Effectiveness
SFA	Stock Fund Account
SNCO	Staff Noncommissioned Officer
S&TE	Support and Test Equipment
TACOM	Tank-Automotive Command
TAFDS	Tactical Airfield Fuel Dispensing System
TAM	Table of Authorized Material
TCDF	Temporary Container Discharge Facility
T&E	Test and Evaluation
T/E	Table of Equipment
TI	Technical Instruction
T/O	Table of Organization
UDI	Unique Data Item
V/STOL	Vertical/Short Takeoff and Landing
WBS	Work Breakdown Structure
WSG	Wing Support Group

EXECUTIVE SUMMARY

The Field Logistics System (FLS) program implementation involves a highly interoperable set of hardware, documentation, and personnel, and reflects a dynamic evolution of events. More specifically, it represents an interface of dimensionally standardized equipment and trained personnel to sustain the Fleet Marine Force (FMF) at a level of logistic response or readiness that is consistent with the operational demands of mission accomplishment. This executive summary provides an overview of the program status as recorded during the first quarter of FY81 and highlights selected accomplishments.

The FLS is comprised of five major subsystems: container, shelter, motor transport, material handling equipment, and service support. These five subsystems encompass 57 elements, equating in total to more than 150,000 separate items of equipment. The FLS elements are judged upon their individual merits with regard to approval for development and acquisition. However, their interrelationships and dependencies, as reflected in the plan, must be recognized and taken into account in order to ensure no degradation of operational capability when FLS equipment is introduced and the current equipment is retired.

The quantities of equipment and funding referred to throughout the plan are specifically structured toward fielding the FLS within the 10-year period ending in FY90, with a concomitant, cost-effective phaseout of material being replaced. This programming approach is in direct accord with OSD consolidated guidance and provides a relatively level procurement funding profile. Acquisition milestones and supporting data are consonant with this 10-year goal.

This plan updates one previously published in December 1979. It provides a current analysis of each element's status, funding profiles, and acquisition milestones. Pertinent issues relating to development and procurement actions are highlighted. Where appropriate, milestone changes are discussed in terms of potential impact upon other developmental efforts. The general development status of the five FLS subsystems is as follows:

- Container. First-generation prototypes of the insert, PALCON, and QUADCON have been fabricated. The QUADCON successfully completed certification tests for intermodal transport. All prototypes will commence engineering development including environment testing during December 1980. Both of the shipping frames have successfully completed development and are ready for service

approval. An OSD waiver has been granted to permit the procurement of commercial flatracks which accommodate large shelters for transport.

- Shelter. Large shelters are in the procurement stage and full-scale production is scheduled in FY81. Small shelter prototypes are currently being fabricated and will be delivered for engineering testing during FY81. Testing on all but the EMI shelters will be completed in FY81. The latter shelters will undergo attenuation tests that may extend into FY82.

- Motor Transport. As the result of recent Congressional approval of the M939 series trucks, procurement efforts are underway to expeditiously obtain these 5-ton vehicles. Full production is anticipated in FY81 with initial deliveries anticipated in FY82.

  Acquisition progress of the 5/4-ton High Mobility Multipurpose Wheeled Vehicle (HMMWV) has not measured up to that planned. A Joint Mission Element Needs Statement for the vehicle was approved by OSD in July 1980. However, the requisite R&D funding to properly support this program has proven elusive, primarily due to unsuccessful reprogramming efforts by the Army, the lead development Service. Continued delay of this program will significantly jeopardize Marine Corps procurement funds currently identified in FY82.

  Prototype models of candidate logistics vehicles will be delivered in FY81 for a competitive runoff with comparable-size, Service-approved Army vehicles. Based upon the results of the evaluation, the Marine Corps may (a) adopt the candidate prototypes, (b) adopt the Army vehicles, or (c) pursue a new candidate for further development.

- Material Handling Equipment. Forklift modifications will be completed during FY81. The 30-ton crane has been introduced to FMF units. This equipment can support increased load handling requirements that will be generated upon the introduction of containers and shelters.

  All development activities for the LACH have been concluded successfully. Procurement efforts for this equipment will commence in FY81.

  Inclusion of the container handler within FLS represents a new start in FY81. Initial evaluation efforts will be centered upon existent commercial equipment and the 5000-pound handler currently in use by the Army.

- Service Support. Many engineering functions presently housed in permanent vehicular-mounted configurations are being modernized and converted into modular assemblies. These and other service support modules will conform to international, intermodal configurations and will eliminate many of the present dedicated motor transport assets. R&D efforts for the service support modules encompass all stages of the acquisition process. Testing during FY80 of prototype galley, sanitation, water purification, and refrigeration units has provided significant performance data to enhance further development.

Current estimates of the R&D funding profiles for these subsystems are as follows: containers, \$4.83 million; shelters, \$1.99 million; motor transport, \$4.25 million; material handling equipment, \$0.53 million; and service support, \$10.72 million. Total FLS RDT&E costs approximate \$22.32 million.

The large number of items in the system and their specific interrelationships require that their order of introduction be carried out in a manner which prevents the degradation of operational capability. In support of this requirement, equipment introduction procedures have been developed for the orderly introduction of FLS items into FMF units, logistics bases, and appropriate formal schools, with a concomitant disposal of items to be replaced. Priorities for introduction of equipment to the field throughout the active and reserve forces are in accordance with current Marine Corps policy. Inventory objectives to be met and the phase-in quantities of equipment in succeeding fiscal years are outlined. These quantities are consistent with procurement objectives and are offset by a nominal 24-month production and fielding interval.

It should be noted that the shelter quantities contained in this plan are being reviewed with the objective of reducing allocations, if practicable. The current quantities are extrapolations of those previously developed in the Shelters Update Study sponsored by MCDEC in 1979. Since that time, quantities were altered only to be consistent with force structure changes.

Significant increases in cost have occurred for MCESS components since the aforementioned study. Originally, it was considered economically feasible to replace most tentage with expeditionary shelters. However, this now appears infeasible because of inflation and the rapid rise in hard shelter costs. Therefore, a critical reassessment of shelter requirements is planned. It will have as one of its objectives the identification and recommended retention of tentage where hard shelter substitutes will not materially enhance the FMF's operational capability.

Management of the FLS acquisition is being accomplished by the Concepts and Requirements Office (Code LM-2) within the Materiel Division of Headquarters, Marine Corps. This office coordinates the various FLS acquisition efforts with all principal Navy and Marine Corps activities, as well as with industry and the other Services.

A system validation model has been designed to examine the capability of the FLS in the combat service support environment. The model examines the throughput/cargo handling features associated with logistic support requirements in the ship-to-shore and basic cargo transfer demands in the amphibious objective area (AOA).

Simulation results indicate that FLS is a valid logistics system which is capable of supporting all MAF 60-day material requirements from the beach to designated destinations

within the AOA in less than fourteen 20-hour days. Further simulation results indicate that the FLS has the following inherent advantages over the existing logistics system.

- Requires less manpower for ship-to-shore operations than the existing system. (Personnel savings generated by reductions in the motor transport inventory will be partially offset by additional personnel required by shelter, container, MHE, and service support subsystems.)
- Reduces material handling operations through the increased sizes of unitized cargo.
- Enables the Marine Corps to take full advantage of commercial containership expeditious load-out capability and high-transit speeds.

A cost comparison study was also conducted which compared the five FLS subsystems with the existing support system. The costs to procure, maintain, and replace the new equipment were compared with a similar distribution of costs for equipment now in the inventory. Although initial procurements for FLS equipment appear to be higher than the costs for existing equipment, factors related to the cost comparison must be understood. Costs for many FLS items are estimates since their programs are still developmental. Costs of existing equipment were obtained by escalating costs identified from past procurements or from past studies to FY82 dollars. In some cases, this escalation may not produce an accurate FY82 value. In fact, some items of existing equipment may no longer be available for procurement. Another factor which must be kept in mind when reviewing the cost comparison is that FLS provides an additional capability, i.e., container handling, which cannot be provided by the present logistics support system. The additional capability may ultimately result in a more cost-effective logistics system through the implementations of FLS, as well as the potential savings related to extended life cycles and reduced maintenance and training costs.

Based on the logistic support simulation results and the aforementioned cost comparison, FLS represents a cost-effective, militarily efficient alternative to the present, less capable logistics system.

A recommended program for POM 83-87, based on the FLS structure, has been prepared to integrate the requisite research, development, and material procurement actions with the associated fiscal resource requirements. This is contained in appendix B to the Master Plan. Funding is depicted in terms of FY82 dollars. Approximate escalation costs, using the latest available Marine Corps price escalation indices, are also provided. As now programmed, appropriation costs are RDT&E, $22.3 million; OMMC, $330.7 million; OMMCR, $100.2 million; and PMC, $1.67 billion for system hardware, $42.2 million for spares and repair parts, $56–$59 million for first and second destination transportation costs and $37.2 million for documentation. Total system costs approximate $2.3 billion.

A logistics concept of operations for the FLS has been developed in support of projected operational scenarios. It features use of FLS equipment in a coordinated support scheme during a MAF operation. The inescapable theme that emerges from this concept is one of increased requirements for detailed logistics planning, scheduling, and task execution in addition to increased equipment interdependencies. Centralized control of material handling equipment and transportation assets appears mandatory within the AOA. The degree of realization of enhanced logistics capability within FLS may well prove to be directly proportional to the level of user orientation, communication, and training conducted at all levels of command.

The shelter manpower/labor analysis contained in the logistics concept of operations outlines various manpower impacts that could be used to determine equipment allowances and densities. Further, it complements an FLS manpower and training analysis which was completed in December 1980. The analysis noted significant resource savings related to FLS when it is fully implemented.

The adaptability of modular FLS equipment to the cargo handling and space characteristics of merchant shipping is a key consideration. Most of this modular equipment will be located in the assault follow-on echelon (AFOE) and will likely be transported to the AOA by merchant shipping. The feasibility and the design concept of modular suiting of merchant shipping has been examined and is detailed in the study entitled "Final Report on Modular Marine Transport Study," which was conducted under the sponsorship of the Naval Sea Systems Command (Code SEA-312).

The FLS implementation program reflects the Marine Corps' equipment response to the interoperability challenges offered by centralized management of operational support and to the utilization of commercial shipping. It also is consistent with the most recent changes to the combat service support force structure. It further complements ongoing U.S. Navy efforts to develop an improved deployable facility to effectively offload containerships, barge carriers, and roll-on/roll-off ships in a wide variety of operational situations. This container offloading and transfer system (COTS), like the FLS, is a vital component of the Department of the Navy's Amphibious Logistics Support Ashore (ALSA) capability.

More recently, ongoing efforts associated with material support of the Rapid Deployment Force have vividly portrayed the urgency and versatility attached to employment of commercial shipping in support of our nation's security.

The continued acquisition and refinement of the FLS will no doubt impact the current FMF employment. However, its introduction and "hands on" experience by Marines will quickly translate into the final system definition.

CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

Since the end of World War II, there has been a significant shift in the national sealift capability. In the early 1950's, the U.S. cargo fleet had in excess of 900 ships. During that period, the dry cargo lift capability was generally resident in the "breakbulk" ships of the fleet. That breakbulk segment, which heretofore had complemented U.S. Naval resources, has subsequently eroded significantly and has become a matter of national security concern.

The composition and physical characteristics of the U.S. merchant fleet have also changed dramatically. Containerships, barge carriers, and roll-on/roll-off ships have proven more efficient and economical and, therefore, are projected to constitute a larger proportion of the fleet than the breakbulk vessels. During the 1980's, more than one-half the dry cargo shipped in the U.S. merchant fleet will be done by means of containerships. In view of these trends, the use of containerships as part of an amphibious task force or assault follow-on echelon is expected.

Coupled with the emergence of newer, faster and more efficient (productive) merchant ships is the fact that the U.S. Navy has experienced a marked decline in its amphibious fleet. Although amphibious shipping has undergone marked operational and technological improvement during this period, the overall lift capacity continues to decline. The current amphibious lift capability of 1.15 Marine Amphibious Forces (MAFs) acts as a stimulus to augmentation planning involving commercial shipping.

In response to this shipping situation, and to adjust to the logistics requirements during the 1985 to 2000 time frame, the Marine Corps is emphasizing the development of equipment compatible with commercial shipping modes, as well as with naval amphibious shipping. Accordingly, accent on the ultimate use of equipment in the amphibious objective area (AOA) is combined with intermodal transportability considerations in formulating the design of new or modified items of combat support and logistic equipment. Transport considerations stress the likelihood of surface movement via containership.

To ensure compatibility with these ships and their mode of operation, equipment design must address the international standards currently in use by the commercial industry. To this end, the Field Logistics System (FLS) program was formally initiated by the Com-

mandant of the Marine Corps on 30 January 1978. With emphasis on dimensional standardization and American National Standards Institute/International Organization for Standardization (ANSI/ISO) compatibility, the acquisition of combat service support equipment under the aegis of the FLS will ensure a fully intermodal transport capability.

Some features of FLS are as follows:

- Use of commercially available containers that adhere to internationally established dimensional standards.
- Use of newly developed intermediate-sized containers, also featuring dimensional standards adherence, for the marshaling, intermodal transport, and warehousing of equipment and supplies.
- Use of dimensionally standard shelters which can be erected and complexed to meet varying user requirements.
- Use of motor transport and material handling equipment in an optimum quantity to ensure that distribution is responsive to material throughput requirements in the area of operations.
- Use of functional service support equipment configured for transport and housing within the dimensionally standard shelters and containers.

In accordance with Naval Facilities Engineering Command Contract No. N00025-77-C-0015, dated 6 September 1977, Northrop Services, Inc. (NSI) was assigned the responsibility for development of a master plan for the orderly, efficient transition from current methods of logistic support to Marine combat forces to that of the new FLS, with a system field introduction goal of 1985. That plan was delivered in final form during September 1978. However, the resources needed to introduce the FLS by 1985 did not conform with existing programming and budgeting constraints.

Consequently, a realignment of the plan was undertaken to conform to those constraints and to pertinent Office of the Secretary of Defense (OSD) guidance which specified that an approximately level annual funding acquisition program be utilized over a 10-year period. In conformance with this direction, the realignment of the plan (covering 56 separate line elements) was completed and delivered in December 1979.

Subsequently, in January 1980, Headquarters, Marine Corps (HQMC) contract No. M00027-80-G-0031 with NSI provided for continued technical services support of the FLS. Under this contract, the FLS implementation plan was expanded to accommodate certain additional equipment acquisitions and their associated development programs while providing for general information updating and overall program changes occurring during 1980. This plan responds to the foregoing direction.

1.2 PURPOSE

The purpose of this master plan is to address the supporting research and development efforts leading to acquisition of the FLS, including the organization structure and management approach being utilized in the acquisition process, the FLS planned equipment introduction schedules, and the associated retirement schedules for existing material to be replaced. Also included are the intended commitment of resources during the midrange period, the desired procurement objectives for these years and the integrated logistic support (ILS), configuration management, and data management programs to be employed. Supportive discussions relating to FLS validity, logistics concepts, and cost-effectiveness analyses in support of timely, efficient introduction of new equipment are also provided.

Because of their importance, the research and development (R&D), equipment introduction and disposal, data management, integrated logistic support, and configuration management chapters are written so they can stand alone; thus, they can be separately examined by those who desire to limit their review to a particular aspect of FLS acquisition. This approach, of necessity, causes some repetition throughout the document.

1.3 APPROACH

The basic approach in developing this plan has been directed toward the introduction of needed equipment in a timely manner consistent with available resources and state-of-the-art technology. The introduction of some FLS equipment has already occurred. These items have been tested, approved for service use, and are now fulfilling field requirements. Other FLS items are in initial stages of development with acquisition profiles that extend beyond 1990. In all these efforts, however, a prime objective has been the full integration and coordination of all facets of the acquisition process. This emphasis on integration is accomplished by treating all elements of the FLS as components of a total system. However, this approach specifically acknowledges that each of the FLS elements could be treated as an independent undertaking. As such, newer equipment would replace obsolete material on an item-for-item basis, and state-of-the-art innovations would produce new or improved service support functions. However, coordinated management of these elements as an interoperable entity would have been lacking, as would optimum management from the standpoint of total system resource involvement. In the integrated approach to acquisition, the progress of each element continues to depend on its individual merits; however, these elements are being developed according to their interrelated operational dependencies, integrated acquisition schedules, and a fully defined FLS budget. These schedules and budget, in turn, give due consideration to maximizing the remaining useful life of existent equipment that will be replaced by FLS items. The quantities of equipment and funding

referred to throughout the plan are specifically structured toward fielding the FLS during the midrange period (primarily during the 1980–1990 time frame) with a concomitant cost-effective phaseout of material being replaced.

In the conduct of material acquisition management, it is necessary to take into account the normal Marine Corps practice of reviewing material procurement requests by functional category and, frequently, on a line element basis. This plan adheres to the normal functional type and line element mode of review for FLS elements. However, in every instance, it should be emphasized that these items are vital parts of the FLS concept and that a budgetary or program sacrifice of any particular item may adversely impact the system capability. In fact, it may cause major readjustments to be made to other critical FLS item schedules and budgets. Piecemeal funding to a well-structured program can have a detrimental effect on its operational capability whenever it is fielded.

The organization structure and management approaches which are discussed also take into account relatively austere personnel ceilings which prevail within HQMC. In this instance, the goal has been to provide the structural requirements to ensure that FLS management needs are met, while holding the disruptive influences on current organizations and administrative procedures to a minimum.

If the FLS is to realize its maximum capability, it must be managed as a system comprised of container, shelter, motor transport, material handling equipment, and service support subsystems. These subsystems have operational dependency relationships as do specific elements within and among other subsystems. Consequently, FLS effectiveness is directly dependent upon the respective states of development for each of its components' elements. To ensure the requisite control, provide the proper degree of management attention to maintain program balance, and to facilitate the orderly, efficient pursuit of all acquisition efforts, a dedicated staff is required. The Concepts and Requirements Office (C&RO), Code LM–2, provides that staff within the Installations and Logistics (I&L) Department of HQMC.

1.4 SCOPE OF EFFORT

Implementation planning for the FLS, in 1977, initially centered upon the acquisition of 42 line elements. Specific planning efforts then included:

- Determination of the development status for all FLS items including, where applicable, definition of the remaining R&D effort which was required, citing the time frame for its reasonable accomplishment and itemizing the resources required.
- Determination of FLS material requirements and the associated costs necessary to outfit a MAF.

- Development of an outline for an equipment introduction and disposal plan, based upon the availability, cost, densities, and scheduling of each item in relation to the criticality of user needs and the remaining service life of equipment to be replaced.
- Structuring a suggested organization and information system for management of the FLS acquisition.
- Development of a POM 80 input which integrated the requisite R&D and material procurement actions with the associated program resource requirements in an orderly, time-phased manner.
- Structuring of a management plan which was fully compatible with, and made optimum use of, existing Marine Corps data sources, while being specifically tailored to FLS management and technical needs.
- Development of initial comparative cost data for FLS items and for the existing equipment which would be phased out of inventory upon FLS introduction.
- Identification of certain studies which were recommended for initiation in support of efficient FLS implementation.

In 1978, the plan was expanded to provide for a time-phased introduction of FLS elements to meet Marine Corps inventory objectives, as opposed to lump-sum initial-issue requirements previously developed. Funding requirements were also made more explicit in the POM 81 input by including O&MMC and O&MMCR appropriations, provisions, spares and repair parts, first and second destination transportation, and documentation costs. Initial plans for training, ILS, and configuration management were developed, and system cost-effectiveness and design validation studies were conducted. The latter included an analysis of material loadout and throughput capabilities and a definition of equipment utility factors. Examinations were conducted that indicated obvious, compelling benefits to the Marine Corps as a result of the responsiveness of the FLS to future amphibious logistical support requirements.

Then, in 1979, the FLS scope was expanded from 42 to 56 line elements. Procurement schedules and funding profiles were adjusted to reflect realistic expectations of resource availability. Based upon OSD guidance and the realities of resource constraints, a 10-year program with a goal of generally level funding outlays was provided. The POM 82 input was formatted to provide this expanded profile. FLS equipment development progress was also reflected in the updated plan in terms of revalidated inventory objectives, attainment or delay of major research and development milestones, and revised introduction and disposal schedules. The plan also presented a logistics concept of operation that portrayed a generalized interface relationship among FLS elements and subsystems.

The current submission of the plan updates the implementation considerations previously addressed. Further, it reflects the deletion of one former item and the addition of two new FLS elements. Promulgation of this revised FLS Master Implementation Plan will

respond to a program coordination need; however, the plan portrays an extremely dynamic system and will fall far short of performing its intended role if it is not properly executed and/or adjusted on a periodic basis where necessary. Satisfactory program execution necessarily implies such things as:

- Ensuring the continued timely response to all POM and budget calls.
- Conducting continuing tradeoff analyses, where necessary, to support emerging hardware design and to facilitate making sound programming decisions.
- Critically reviewing development progress and performance results across the full research and development process. (Milestone Achievement)
- Timely redirection of efforts and resources as may be required.
- Efficiently managing a wealth of technical and program data so that necessary reference material is readily available and properly controlled.

The plan reflects the Marine Corps' equipment response to the interoperability challenges offered by centralized operational support management and the utilization of commercial shipping. It also reflects the changes to the combat service support force structure as of 11 July 1980. It further complements ongoing U.S. Navy efforts to develop an improved, deployable facility to effectively offload containerships, barge carriers, and roll-on/roll-off ships in a wide variety of operational situations. This container offloading and transfer system (COTS), like the FLS, is a vital component of the amphibious logistics support ashore (ALSA) capability.

Additionally, the Maritime Administration's project "Sea Shed" has bearing upon FLS. This project is directed toward maximizing the usefulness of non-self-sustaining containerships in the movement of outsized military cargo in support of a rapid deployment. Obviously, Sea Shed's complementary relationship to modular suiting and its effect on the Marine Corps' capability to deploy its forces are of significance.

Recent developments involving the Rapid Deployment Force further exemplify the urgency and versatility attached to employment of commercial shipping in support of our nation's security.

CHAPTER 2

RESEARCH AND DEVELOPMENT

2.1 INTRODUCTION

This chapter provides an updated assessment of each FLS element in terms of its progression through the major events of the systems acquisition process. The assessment includes pertinent issues portrayed within the current development status of these elements. Because of the dynamic nature of the R&D environment, further updates of this chapter should be periodically conducted to reflect the latest milestone accomplishments and trends. This will provide cognizant acquisition managers with the information required to ensure a systematic, coordinated development of FLS elements.

This chapter addresses each of the 57 elements currently in the FLS in a format designed to provide information concerning two of the most important factors in R&D management, i.e., schedules and funds. Some elements have either completed their R&D evolution or are commercially available and are, therefore, not subject to the R&D program. However, other FLS items, which constitute the vast majority of the program, range throughout the various stages of development. It is this latter group that must be processed through the RDT&E cycle in a timely manner consistent with the planned phase-in schedule and equipment dependencies of the FLS program.

2.2 SYSTEM DESCRIPTION

The FLS is currently divided into five major functional subsystems, as follows:

Subsystem	Line No.	Element
Container	1	Insert
	2	PALCON
	3	QUADCON
	4	Container 8'x8'x20'
	5	Flatrack 8'x8'x20'
	6	Flatrack 8½'x8'x40'
	7	Shipping Frame 8'x8'x10'
	8	Shipping Frame 4'x6-2/3'x8'

Subsystem	Line No.	Element
Shelter	9	Shelter 60'x128'
	10	Shelter 32'x73'
	11	Shelter 20'x33'
	12	Shelter 8'x8'x20' Knockdown
	13	Shelter 8'x8'x20' Rigid/GP
	14	Shelter 8'x8'x20' EMI
	15	Shelter 8'x8'x10' EMI
	16	Shelter Joining Corridor 7'x7'x11'
	17	Shelter Appointments
Motor Transport	18	High Mobility Multipurpose Wheeled Vehicle (HMMWV)
	19	Heavy High Mobility Tactical Truck (HHMTT)
	20	Medium Prime Mover
	21	Heavy Prime Mover
	22	Logistics Trailer, 12.5-ton
	23	Logistics Trailer, 22.5-ton
	24	Mobilizer/Transporter
	25	Semitrailer, 65-ton
Material Handling Equipment	26	Rough Terrain Forklift, 4,000-lb
	27	Rough Terrain Forklift, 6,000-lb
	28	Rough Terrain Forklift, 10,000-lb
	29	Rough Terrain Crane, 30-ton
	30	Container Handler
	31	Lightweight Amphibious Container Handler (LACH)
Service Support	32	Bridging, Dry Gap
	33	Bridging, Wet Gap
	34	Marine Corps Environment Controlled Medical System (MCEMS)
	35	Fuel/Water Storage Module
	36	Fuel Pump Module
	37	Water Purification System
	38	Soil Stabilization Module (AMSS)
	39	Firefighting Equipment
	40	Sanitation Unit
	41	Combined Laundry and Bath Unit
	42	Dump Module
	43	Refrigeration System
	44	Mobile Electric Power Distribution System (MEPDIS)
	45	Air Conditioners
	46	Electric Generators
	47	Bulk Laundry Unit
	48	Bath/Shower Unit
	49	Marine Corps Field Feeding System (MFFS)
	50	Bakery System
	51	Scraper, Earthmoving
	52	Tractor, Full Tracked
	53	Lubrication Service Unit
	54	Steam Cleaner Unit
	55	Amphibious Assault Fuel System (AAFS)
	56	Tactical Airfield Fuel Dispensing System (TAFDS)
	57	Helicopter Expedient Refueling System (HERS)

Other items of equipment, though not currently under the aegis of the FLS, may be included in future developments. Examples of such items may include a utility tiltbed trailer, container ramp, scullery module, arc welding machine unit, air compressor unit, and floating bridge pontoon.

2.3 ELEMENT ASSESSMENT

2.3.1 Status

The status of each element and the primary effort associated with that milestone are delineated. Milestone definitions are as follows:

- Milestone 0 - Program initiation approval
- Milestone 1 - Program feasibility approval
- Milestone 2 - Program validation approval
- Milestone 3 - Service use approval

Dates listed for development status (e.g., exploratory, advanced, and full-scale) represent their anticipated completion. The milestone schedules, in most cases, are derived from Project Work Directives. Other information sources include Acquisition Coordinating Group (ACG) schedules, program review findings, and, in some instances, best estimates based upon resources available and the urgency of the requirement.

2.3.2 Funding

Expenditures are based upon historical data while future commitments have been extracted, for most elements, from the Five Year Defense Plan (FYDP). In numerous instances funding allocations remain beyond the scheduled end of the R&D process. This is a normal FYDP circumstance that reflects second generation development of follow-on equipment or the use of funds in the outyears as a planning wedge for future projects. There are instances where several FLS elements comprise a single FYDP entry. In those cases, funding has been prorated based upon the projected unit cost of individual FLS elements.

2.3.3 Principals

Key personnel associated with the research and development of FLS elements are listed, along with their assignments and commercial phone numbers.

2.3.4 Issues

Issues are highlighted as they pertain to the adequacy of funds to support the established schedules and the adequacy of these schedules to accommodate test objectives. In certain instances, some FLS elements are being funded in R&D projects at a level of involvement, i.e., advanced or full-scale development, that is not in consonance with the actual work being performed. This issue, as well as other pertinent aspects of the R&D assessment, are addressed in the following pages of this chapter.

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: INSERT
Line Item No. 1
R&D Project No. C0939
Date: 1 December 1980

STATUS

Delivery of experimental models from Rohr Industries to CEL occurred during the fourth quarter of FY80. Prime emphasis during advance development will be on developmental testing. Operational testing will follow upon the delivery of final prototype models during FY82.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 21 February 1979
Exploratory development	Completed
Milestone 1	1st Quarter FY81
Advanced development	3rd Quarter FY81
Milestone 2	4th Quarter FY81
Full-scale development	4th Quarter FY82
Milestone 3	4th Quarter FY82

FUNDING

Funding is adequate to support the development program. Amounts listed for each container type have been prorated according to anticipated respective production costs. Post FY82 funds are planning wedges for follow-on development/improvement.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
7	11	10	13	13	13	10	77

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Maj. B. P. Westmoreland	(703) 640-3286
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: PALCON
Line Item No. 2
R&D Project No. C0939
Date: 1 December 1980
STATUS

Delivery of experimental models from Rohr Industries to CEL occurred during the fourth quarter of FY80. Prime emphasis during advance development will be on developmental testing. Operational testing will follow upon the delivery of final prototype models during FY82.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 21 February 1979
Exploratory development	Completed
Milestone 1	1st Quarter FY81
Advanced development	3rd Quarter FY81
Milestone 2	4th Quarter FY81
Full-scale development	4th Quarter FY82
Milestone 3	4th Quarter FY82

FUNDING

Funding is adequate to support the development program. Amounts listed for each container type have been prorated according to anticipated respective production costs. Post FY82 funds are planning wedges for follow-on development/improvement and are derived from the Five Year Defense Plan (FYDP).

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
81	125	119	160	159	159	117	920

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Maj. B. P. Westmoreland	(703) 640-3286
Development Activity/Agency:	Not applicable	

Element: QUADCON
Line Item No. 3
R&D Project No. C0939
Date: 1 December 1980

STATUS

Delivery of experimental models from Rohr Industries to CEL occurred during the 4th quarter of FY80. Prime emphasis during advanced development will be on developmental testing. This will include ISO certification and connector hardware feasibility. Acceptability parameters for the connectors must be established based upon costs and state-of-the-art. Operational testing will be emphasized upon the delivery of final prototype models during FY82.

Milestone Status

Program definition	Completed
Milestone 0	ADM 21 February 1979
Exploratory development	Completed
Milestone 1	1st Quarter FY81
Advanced development	3rd Quarter FY81
Milestone 2	4th Quarter FY81
Full-scale development	4th Quarter FY82
Milestone 3	4th Quarter FY82

FUNDING

Funding is adequate to support the development program. Amounts listed for each container type have been prorated according to anticipated respective production costs. Post FY82 funds are planning wedges for follow-on development/improvement and are derived from the Five Year Defense Plan (FYDP).

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
335	515	497	665	664	664	493	3,833

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Maj. B. P. Westmoreland	(703) 640-3286
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: CONTAINER, 8'x8'x20'
Line Item No. 4
R&D Project No. (N/A)
Date: 1 December 1980

STATUS

This item is in widespread commercial use, and R&D efforts are not anticipated. Current service ownership is not permitted under DOD policy. However, a memo from the Assistant Secretary of Defense (MRA&L) of 17 June 80 addressed the current shortages of 20-foot containers for military leasing. A special review is currently being conducted to recommend a proper course of action.

Milestone Status	
Program definition	Not applicable
Milestone 0	Not applicable
Exploratory development	Not applicable
Milestone 1	Not applicable
Advanced development	Not applicable
Milestone 2	Not applicable
Full-scale development	Not applicable
Milestone 3	Not applicable

FUNDING

None required.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: FLATRACK, 8'x8'x20'
Line Item No. 5
R&D Project No. (N/A)
Date: 1 December 1980

STATUS

This element is commercially available and R&D efforts are not required. Current DOD regulations preclude service ownership of commercial containers, both opened and closed. These flatracks are required for the transport of 20'x33' and 32'x73' large shelters and joining corridors. In order to ensure the availability of these units, a waiver request was submitted to OSD to permit procurement action. This waiver was approved by OSD (MRA&L) in July 1980 and will enable a concurrent flatrack acquisition along with that of the large shelters. Additional units should be leased to test the operational capabilities of other new FLS elements, i.e., material handling and motor transport equipment. Procurement specification determination is pending.

Milestone Status	
Program definition	Not applicable
Milestone 0	Not applicable
Exploratory development	Not applicable
Milestone 1	Not applicable
Advanced development	Not applicable
Milestone 2	Not applicable
Full-scale development	Not applicable
Milestone 3	Not applicable

FUNDING

None required.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: FLATRACK, 8½'x8'x40'
Line Item No. 6
R&D Project No. (N/A)
Date: 1 December 1980

STATUS

This element is commercially available and R&D efforts are not required. Current DOD regulations preclude service ownership of commercial containers, both opened and closed. These flatracks are required for the transport of the 60'x128' shelter and may be required for the fully intermodal transport of motor transport and material handling equipment. A procurement waiver request was submitted to OSD to permit procurement action. This waiver was approved by OSD (MRA&L) in July 1980 and will enable a concurrent flatrack acquisition along with that of the large shelters. Additional units should be leased to test the operational capabilities of other new FLS elements, i.e., motor transport and material handling equipment.

Milestone Status	
Program definition	Not applicable
Milestone 0	Not applicable
Exploratory development	Not applicable
Milestone 1	Not applicable
Advanced development	Not applicable
Milestone 2	Not applicable
Full-scale development	Not applicable
Milestone 3	Not applicable

FUNDING

None required.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHIPPING FRAME, 8'x8'x10'
Line Item No. 7
R&D Project No. [illegible]939
Date: 1 December 1980

STATUS

R&D efforts for this frame were conducted in association with the development of the Reverse Osmosis Water Purification Unit (ROWPU) project. The development of a general purpose shipping frame (8'x8'x10') and its international certification (ISO) preceded its configuration for the ROWPU. Milestone 3 reflects the R&D completion for this element configured both for general use and for the ROWPU.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 21 February 1979
Exploratory development	Completed
Milestone 1	ADM 16 October 1979
Advanced development	Completed
Milestone 2	ADM 16 October 1979
Full-scale development	Completed
Milestone 3	1st Quarter FY81

FUNDING

None required. Potentially unique restraint systems for other new equipment will be funded within the R&D effort of that equipment.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Unassigned	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHIPPING FRAME, 4'x6-2/3'x8'
Line Item No. 8
R&D Project No. C0939
Date: 1 December 1980

STATUS

R&D efforts for this frame were conducted in association with the development of the SIXCON (Fuel/Water Storage Module) project. The development of a general purpose shipping frame (4'x6-2/3' x 8') and its international certification (ISO) preceded its configuration as a storage module. Milestone 3 reflects the R&D completion for this element configured both for general use and as a storage module.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 21 February 1979
Exploratory development	Completed
Milestone 1	ADM 16 October 1979
Advanced development	Completed
Milestone 2	ADM 16 October 1979
Full-scale development	Completed
Milestone 3	1st Quarter FY81

FUNDING

None required. Potentially unique restraint systems for other new equipment will be funded within the R&D effort of that equipment.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Unassigned	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHELTER, 60'x128'
Line Item No. 9
R&D Project No. (N/A)
Date: 1 December 1980

STATUS

This element was approved for service use on 27 December 1978. Procurement actions are currently underway. No further R&D effort is anticipated. Any further changes will be in the nature of product improvements. Current erection exercises in Twenty-Nine Palms, California will generate engineering changes that will impact on the recently awarded procurement contract.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	Completed
Milestone 3	ADM 27 December 1978

FUNDING

None required. If ancillary projects are instituted, funding could be made available from R&D Project No. C0081, currently being used for the small shelters.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHELTER, 32'x73'
Line Item No. 10
R&D Project No. (N/A)
Date: 1 December 1980

STATUS

This element was approved for service use on 27 December 1978. Procurement actions are currently in progress. No further R&D effort is anticipated. Any further changes will be in the nature of product improvements.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	Completed
Milestone 3	ADM 27 December 1978

FUNDING

None required. If ancillary projects are instituted, funding could be made available from R&D Project No. C0081, currently being used for the small shelters.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHELTER, 20'x33'
Line Item No. 11
R&D Project No. (N/A)
Date: 1 December 1980

STATUS

This element was approved for service use on 27 December 1978. Procurement actions are currently in progress. No further R&D effort is anticipated. Any further changes will be in the nature of product improvements.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	Completed
Milestone 3	ADM 27 December 1978

FUNDING

None required. If ancillary projects are instituted, funding could be made available from R&D Project No. C0081, currently being used for the small shelters.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHELTER, 8'x8'x20' KD
Line Item No. 12
R&D Project No. C0081
Date: 1 December 1980

STATUS

Fabrication of full-scale engineering prototypes is underway at the Brunswick Corporation, Marion, Virginia. Delivery of these prototypes is scheduled during the first quarter of FY81, with DT/OT-II commencing immediately thereafter. Concurrent with the fabrication is the upgrading of the procurement documentation package (specifications and drawings) to a Level-III status. All milestones appear to be attainable in light of the current R&D activity.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	3rd Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding appears to be adequate in view of remaining R&D objectiver. Post-FY82 funds will be used for design improvements, such as lightweight panel fabrication and as planning wedges in the FYDP.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
51	67	50	62	64	64	60	418

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Lt. Col. R. Whiting	(703) 640-3286
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 9[illegible]-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHELTER, 8'x8'x20' R
Line Item No. 13
R&D Project No. C0081
Date: 1 December 1980

STATUS

Fabrication of full-scale engineering prototypes is underway at the Brunswick Corporation, Marion, Virginia. Delivery of these prototypes is scheduled during the first quarter of FY81, with DT/OT-II commencing immediately thereafter. Concurrent with the fabrication is the upgrading of the procurement documentation package (specifications and drawings) to a Level-III status. All milestones appear to be attainable in light of the current R&D activity.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	3rd Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding appears to be adequate in view of remaining R&D objectives. Post-FY82 funds will be used for design improvements and are planning wedges in the FYDP.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
50	50	47	60	60	60	60	387

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Lt. Col. R. Whiting	(703) 640-3286
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHELTER, 8'x8'x20' EMI
Line Item No. 14
R&D Project No. C0081
Date: 1 December 1980

STATUS

Fabrication of full-scale engineering prototypes is underway at the Brunswick Corporation, Marion, Virginia. Delivery of these prototypes to MCLB, Albany, is scheduled during the second quarter of FY81, with DT/OT–II commencing immediately thereafter. Of concern is the attenuation of emissions and the test procedures to evaluate the attenuation. Initial tests will be conducted at the manufacturer's facility, followed by more testing upon delivery. Final attenuation tests are not planned until the first quarter of FY82. In light of the foregoing, the milestone schedule appears tenuous. However, sufficient numbers of other types of shelters should uphold a viable procurement schedule in FY82.

Milestone Status

Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	3rd Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding appears to be adequate in view of remaining R&D objectives. Post-FY82 funds will be used for design improvements and are planning wedges in the FYDP.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
46	75	70	75	75	75	75	491

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Lt. Col. R. Whiting	(703) 640-3286
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SHELTER, 8'x8'x10' EMI
Line Item No. 15
R&D Project No. C0081
Date: 1 December 1980

STATUS

Fabrication of full-scale engineering prototypes is underway at the Brunswick Corporation, Marion, Virginia. Delivery of these prototypes to MCLB, Albany, is scheduled during the second quarter of FY81, with DT/OT-II commencing immediately thereafter. Of concern is the attenuation of emissions and the test procedures to evaluate the attenuation. Initial tests will be conducted at the manufacturer's facility, followed by more testing upon delivery. Final attenuation tests are not planned until the first quarter of FY82. In light of the foregoing, the milestone schedule appears tenuous. However, sufficient numbers of other types of shelters should uphold a viable procurement schedule in FY82.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	3rd Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding appears to be adequate in view of remaining R&D objectives. Post-FY82 funds will be used for design improvements and are planning wedges in the FYDP.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
46	75	70	75	75	75	75	491

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Lt. Col. R. Whiting	(703) 640-3286
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

Element: SHELTER JOINING CORRIDOR, 7'x7'x11'
Line Item No. 16
R&D Project No. C0081
Date: 1 December 1980

STATUS

Fabrication of full-scale engineering prototypes is underway at the Brunswick Corporation, Marion, Virginia. Delivery of these prototypes is scheduled during the first quarter of FY81, with DT/OT-II commencing immediately thereafter. Concurrent with the fabrication is the upgrading of the procurement documentation package (specifications and drawings) to a Level-III status. All milestones appear to be attainable in light of the current R&D activity.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	3rd Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding appears to be adequate in view of remaining R&D objectives. Post-FY82 funds will be used for design improvements and are planning wedges in the FYDP.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
15	20	20	20	20	20	20	135

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Lt. Col. R. Whiting	(703) 640-3286
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

Element: SHELTER APPOINTMENTS
Line Item No. 17
R&D Project No. C0081
Date: 1 December 1980

STATUS

This task applies to appointments that will be common to all shelters, regardless of their usage. Specific development milestones are inherent to the shelter family as a whole and, as such, are not treated separately. However, procurement actions must be timely in order not to delay the outfitting of the shelters upon their fabrication. The planned DT/OT-II test period is 6 months in duration and is scheduled to commence immediately upon delivery of the shelter prototypes. This schedule must allow for appointment outfitting at MCLB, Albany; test personnel training and familiarization; and for item transportation to Camp Lejeune. In view of the magnitude of these actions, this schedule appears very tenuous.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 27 December 1978
Exploratory development	Completed
Milestone 1	ADM 27 December 1978
Advanced development	Completed
Milestone 2	ADM 27 December 1978
Full-scale development	3rd Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding appears adequate as stated in the FYDP. No additional test item procurements are planned.

Funding Status ($000)							
FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
10	10	10	10	10	10	10	70

PRINCIPALS

Acquisition Sponsor Project Officer:	Mr. R. Riggs	(202) 697-6950
Acquisition Project Officer:	Ms. B. Patton	(202) 695-3072
Development Project Officer:	Lt. Col. B. Barents	(703) 640-2242
Operational Test Project Officer:	Lt. Col. R. Whiting	(703) 640-3286
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV)
Line Item No. 18
R&D Project No. C0075-J
Date: 1 December 1980

STATUS

This milestone status is predicated upon a 6-month fabrication period for first generation prototypes. This is possible due to the intense interest and marketing efforts of at least three manufacturers. A Joint Mission Element Needs Statement (J-MENS) has been approved by OSD. Nonetheless, funding arrangements by the Army, the lead Service, have failed to materialize. Accordingly, R&D efforts to initiate test item procurement are at a stalemate. Funds for the initial production procurement are now identified in FY83. R&D schedule slippage will jeopardize these funds.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 1 May 1979
Exploratory development	Completed
Milestone 1	1st Quarter FY81
Advanced development	2nd Quarter FY82
Milestone 2	2nd Quarter FY82
Full-scale development	3rd Quarter FY82
Milestone 3	4th Quarter FY82

FUNDING

The current profile appears adequate to supplement the Army's effort.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
351	350	300	200	100	125	150	1,576

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. D. Gee	(202) 695-3041
Development Project Officer:	Maj. A. Shadforth	(703) 640-2242
Operational Test Project Officer:	Maj. B. P. Westmoreland	(703) 640-3286
Development Activity/Agency:	TACOM (MCLnO)	(313) 573-2535

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: HEAVY HIGH MOBILITY TACTICAL TRUCK (HHMTT)
Line Item No. 19
R&D Project No. C0075-K
Date: 1 December 1980

STATUS

The M-939 series 5-ton truck, although not a true HHMTT, has recently been adopted to satisfy the requirement. Initial procurement will commence in FY81 and will include a cargo, a long wheelbase, and a wrecker version of the truck. Service life with a rebuild at the midpoint is programmed over a 16-year period.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding is adequate to develop the necessary software and devices to assist and expedite the introduction of the M-939 into the FMF. Post-FY85 funds reflect fiscal planning wedges in the FYDP.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
6	2	0	0	0	50	50	108

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. H. A. Weeg	(202) 695-3041
Development Project Officer:	Capt. A. Schuler	(703) 640-2634
Operational Test Project Officer:	1/Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	TACOM (MCLnO)	(313) 573-2535

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: MEDIUM PRIME MOVER
Line Item No. 20
R&D Project No. C0075-D
Date: 1 December 1980

STATUS

While a requirement for this vehicle has been promulgated, it now appears possible that the heavy prime mover will satisfy all logistics trailer hauling requirements. Accordingly, a decision regarding further development of this vehicle will be based on the outcome of the DT/OT-I of the heavy prime mover. No active development actions are planned during FY81. Should development be considered necessary, it will commence in FY82 using data established during the heavy prime mover testing. Thereafter, full scale development with prototype models could commence in FY83.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 1 May 1979
Exploratory development	Completed
Milestone 1	ADM 2 June 1980
Advanced development	3rd Quarter FY83
Milestone 2	4th Quarter FY83
Full-scale development	1st Quarter FY85
Milestone 3	1st Quarter FY85

FUNDING

Funding is adequate to support this program. Planning wedges for TAD are provided in FY81—82 and test item procurement funds are identified in FY83 and beyond, if required.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
.5	.5	260	152	105	25	10	553

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. J. Gruehl	(202) 695-3041
Development Project Officer:	Capt. R. Hickman	(703) 640-2225
Operational Test Project Officer:	1/Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: HEAVY PRIME MOVER
Line Item No. 21
R&D Project No. C0075-F
Date: 1 December 1980

STATUS

The current milestone schedule is recognized as being extremely optimistic, but is feasible. It is predicated upon the delivery of prototype models prior to April 1981. These vehicles will be tested against baseline data established by the M915 and M870 series of tractors and trailers. These baseline vehicles are service approved and provide a viable option if the prototypes do not offer significant gains. Test planning is underway for Aberdeen Proving Grounds and Camp LeJeune; however, its execution, which implies the acquisition of supporting resources, ranges, and trained personnel, must be closely monitored.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 1 May 1979
Exploratory development	Completed
Milestone 1	ADM 2 June 1980
Advanced development	4th Quarter FY81
Milestone 2	1st Quarter FY82
Full-scale development	2nd Quarter FY83
Milestone 3	2nd Quarter FY83

FUNDING

Funding is austere and is marginally supportive of a multivehicle test item procurement. Failure to complete the planned FY80 test item procurements would necessitate the need for additional funds in FY81.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
297	250	.5	.5	0	1	1	550

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. J. Gruehl	(202) 695-3041
Development Project Officer:	Capt. R. Hickman	(703) 640-2245
Operational Test Project Officer:	1/Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: LOGISTICS TRAILER, 12.5-ton
Line Item No. 22
R&D Project No. C0075-E
Date: 1 December 1980

STATUS

While a requirement for this vehicle has been promulgated, it appears possible that the 22.5-ton logistics trailer can satisfy all appropriate transport requirements. Accordingly, development of this vehicle is being held in abeyance pending the outcome of the DT/OT–I of the 22.5-ton logistics trailer. Therefore, no R&D actions are planned during FY81. Should development be considered necessary, it will commence in FY82. Thereafter, full-scale development with prototype models will commence in FY83.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 1 May 1979
Exploratory development	Completed
Milestone 1	ADM 2 June 1980
Advanced development	3rd Quarter FY83
Milestone 2	4th Quarter FY83
Full-scale development	1st Quarter FY85
Milestone 3	1st Quarter FY85

FUNDING

Funding is adequate to support this program. Planning wedges for TAD are provided in FY81–82 and test item procurement funds are identified in FY83 and beyond, if required.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
.5	.5	150	100	58	20	5	334

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. J. Gruehl	(202) 695-3041
Development Project Officer:	Capt. R. Hickman	(703) 640-2245
Operational Test Project Officer:	1/Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: LOGISTICS TRAILER, 22.5-ton
Line Item No. 23
R&D Project No. C0075-G
Date: 1 December 1980

STATUS

The milestone schedule is acknowledged as being extremely optimistic but feasible. It is predicated upon the delivery of prototype models prior to April 1981. These vehicles will be tested in competition against baseline data established by the M-915 and M-870 series of tractors and trailers. These baseline vehicles are service approved and provide a viable option should the prototype models not offer substantial performance gains. Test planning is underway; however, its execution, which implies the acquisition of supporting resources, ranges, and trained personnel, must be closely monitored.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 1 May 1979
Exploratory development	Completed
Milestone 1	ADM 2 June 1980
Advanced development	4th Quarter FY81
Milestone 2	1st Quarter FY82
Full-scale development	2nd Quarter FY83
Milestone 3	2nd Quarter FY83

FUNDING

Funding is austere and is marginally supportive of a multivehicle test item procurement. Failure to complete the planned FY80 test item procurements would necessitate the need for additional funds in FY81.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
245	65	.5	.5	0	1	1	313

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. J. Gruehl	(202) 695-3041
Development Project Officer:	Capt. R. Hickman	(703) 640-2245
Operational Test Project Officer:	1/Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: MOBILIZER/TRANSPORTER
Line Item No. 24
R&D Project No. Unassigned (C0075-X is a candidate)
Date: 1 December 1980

STATUS

This will be a new start in FY81. It reflects the mobility requirements of 40-foot flatracks that will house the components of the large shelters. Initial actions will be directed to determine the type of vehicle that is feasible and affordable.

Milestone Status	
Program definition	1st Quarter FY81
Milestone 0	1st Quarter FY81
Exploratory development	1st Quarter FY82
Milestone 1	2nd Quarter FY82
Advanced development	1st Quarter FY83
Milestone 2	1st Quarter FY83
Full-scale development	4th Quarter FY83
Milestone 3	4th Quarter FY83

FUNDING

Funding is supportive of test item procurement in FY82 with appropriate evaluations occurring during FY83 and beyond.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
30	140	75	75	25	25	20	390

PRINCIPALS

Acquisition Sponsor Project Office:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. D. Gee	(202) 695-3041
Development Project Officer:	Capt. R. Hickman	(703) 640-2245
Operational Test Project Officer:	1/Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SEMITRAILER, 65-ton
Line Item No. 25
R&D Project No. C0075-I
Date: 1 December 1980

STATUS

The milestone schedule reflects the utility of the current 65-ton heavy equipment transporters and their projected life expectancy beyond the midterm. If the requirement existed for a more rapid initial production period, this schedule could be significantly accelerated.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 1 May 1979
Exploratory development	2nd Quarter FY81
Milestone 1	2nd Quarter FY81
Advanced development	4th Quarter FY83
Milestone 2	4th Quarter FY83
Full-scale development	4th Quarter FY85
Milestone 3	4th Quarter FY85

FUNDING

Funding is adequate to support the level and pace of development as currently envisioned. This project should transition to a 6.4 level program during FY84.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
.5	1	1	200	150	50	20	422.5

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. J. Gruehl	(202) 695-3041
Development Project Officer:	Capt. R. Hickman	(703) 640-2245
Operational Test Project Officer:	1st Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	MCDEC	

Element: ROUGH TERRAIN FORKLIFT, 4,000-lb
Line Item No. 26
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

Modification kits for the 4,000-pound forklift have been approved for procurement. No further R&D effort is currently planned.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Capt. Tokarcz	(202) 697-3618
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: ROUGH TERRAIN FORKLIFT, 6,000-lb
Line Item No. 27
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

R&D actions on the 6,000-pound forklift have been completed. A procurement contract for 504 units was negotiated in the second quarter of FY79.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Capt. Tokarcz	(202) 697-3618
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: ROUGH TERRAIN FORKLIFT, 10,000-lb
Line Item No. 28
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

The 10,000-pound forklift is currently being rebuilt. No further R&D effort is currently planned.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding Status ($000)							
FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Capt. Tokarcz	(202) 697-3618
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: ROUGH TERRAIN CRANE, 30-ton
Line Item No. 29
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

R&D actions have been completed. The 30-ton crane was introduced to the operating forces in FY79.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Capt. Tokarcz	(202) 697-3618
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: CONTAINER HANDLER
Line Item No. 30
R&D Project No. C0078-A
Date: 1 December 1980

STATUS

This is a new start in FY81. It recognizes the need for efficient equipment to transfer and move 20-foot shelters and containers up to 40 feet within the combat service support area. Initial efforts will investigate the optimum capacity of the handler as well as the adaptability of commercial or other service-approved equipment.

Milestone Status	
Program definition	3rd Quarter FY81
Milestone 0	3rd Quarter FY81
Exploratory development	3rd Quarter FY81
Milestone 1	3rd Quarter FY81
Advanced development	1st Quarter FY82
Milestone 2	1st Quarter FY82
Full-scale development	3rd Quarter FY83
Milestone 3	4th Quarter FY83

FUNDING

Funding is adequate to support a test item procurement in FY82 with testing and evaluations thereafter.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
30	250	100	50	35	30	30	525

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Lt. Col. T. Cucina	(202) 697-3618
Development Project Officer:	Maj. M. Nereim	(703) 640-2021
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: LACH
Line Item No. 31
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

Development activities on the LACH were completed in FY80 with the formulation of a procurement data package. Procurement is scheduled to commence in FY81.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 15 December 1978
Exploratory development	Completed
Milestone 1	ADM 15 December 1978
Advanced development	Completed
Milestone 2	ADM 15 December 1978
Full-scale development	Completed
Milestone 3	ADM 15 December 1978

FUNDING

None.

Funding Status ($000)							
FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Capt. Tokarcz	(202) 697-3618
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: BRIDGING, DRY GAP
Line Item No. 32
R&D Project No. C0079-H
Date: 1 December 1980

STATUS

The Medium Girder Bridge (MGB) has been approved for service use by the Army and Marine Corps. Follow-on R&D efforts are being undertaken to package the MGB's components into an ISO configuration. (See item 33.)

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding Status ($000)							
FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	Maj. M. Nereim	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: BRIDGING, WET GAP
Line Item No. 33
R&D Project No. C0079-H
Date: 1 December 1980

STATUS

The schedule appears feasible to support development of a pontoon-type shipping container. A decision is required to determine if this project constitutes a product improvement of the current dry gap capability or if the project should be classified as a new initiative.

Milestone Status	
Program definition	1st Quarter FY81
Milestone 0	1st Quarter FY81
Exploratory development	3rd Quarter FY81
Milestone 1	3rd Quarter FY81
Advanced development	2nd Quarter FY82
Milestone 2	2nd Quarter FY82
Full-scale development	4th Quarter FY83
Milestone 3	4th Quarter FY83

FUNDING

This is a 6.4 level project (C0079–H) and, as such, is not applicable to either a product improvement program (2.6) or a new initiative (6.2). Funding in FY84 and beyond reflects potential second-generation development efforts possibly extending to an assault bridging capability.

Funding Status ($000)							
FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
245	260	365	390	525	565	500	2,850

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	Maj. M. Nereim	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: MCEMS
Line Item No. 34
R&D Project No. C0083
Date: 1 December 1980

STATUS

The milestone schedule is supportive of the development and introduction of five of the 14 functional components of MCEMS. The remaining nine additional functions plus dental are programmed during the FY81-85 time frame. Initial operational testing at Camp Lejeune during FY80 has effected an increased confidence factor for successful attainment of R&D objectives.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 30 May 1975
Exploratory development	Completed
Milestone 1	ADM 30 May 1975
Advanced development	Completed
Milestone 2	Completed
Full-scale development	3rd Quarter FY81
Milestone 3	3rd Quarter FY81

FUNDING

Funding appears to be responsive to projected R&D needs.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
415	184	103	119	132	132	50	1,135

PRINCIPALS

Acquisition Sponsor Project Officer:	Col. J. Burke	(202) 697-6950
Acquisition Project Officer:	HMCS G. Crouch	(202) 695-3072
Development Project Officer:	LCDR H. White	(703) 640-2532
Operational Test Project Officer:	Lt. Col. R. Whiting	(703) 640-3286
Development Activity/Agency:	2nd Med. Bn.	(919) 451-4322

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: FUEL/WATER STORAGE MODULE
Line Item No. 35
R&D Project No. C0079-C
Date: 1 December 1980

STATUS

The basic frame that houses the storage tank has been developed and certified (ISO). It is currently ready for service approval. The rectangular storage tank, when used for volatile liquids, did not meet international standards. The redesign effort to develop an acceptable elliptical tank will cause a 1-year slippage for milestone 3.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 25 January 1979
Exploratory development	Completed
Milestone 1	ADM 25 January 1979
Advanced development	Completed
Milestone 2	2nd Quarter FY81
Full-scale development	4th Quarter FY 82
Milestone 3	4th Quarter FY82

FUNDING

Funding is adequate. This R&D project (C0079) includes the Expeditionary Bulk Fuel Program. Several subprojects such as firefighting equipment, shipping frames (SIX-CONs), and pump modules are funded from this project.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
85	130	65	30	15	15	15	355

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	CWO 4 N. Wilson	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

Element: FUEL PUMP MODULE
Line Item No. 36
R&D Project No. C0079-C
Date: 1 December 1980

STATUS

Engineering changes to incorporate a low-pressure command circuit have been incorporated. Evaluation of modified pumps will be conducted in DT/OT-II during FY81. The basic frame that houses the pump has been ISO certified and is ready for service approval.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 25 January 1979
Exploratory development	Completed
Milestone 1	ADM 25 January 1979
Advanced development	Completed
Milestone 2	2nd Quarter FY81
Full-scale development	4th Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding beyond FY81 reflects efforts to develop pump controls at CEL. Additional funds will be required to upgrade current pumps or to develop a modified pump for AV-8A fueling operations.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
81	100	60	20	10	10	10	291

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	CWO 4 N. Wilson	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: WATER PURIFICATION SYSTEM
Line Item No. 37
R&D Project No.–Not Applicable
Date: 1 December 1980

STATUS

R&D actions were completed in FY79. The 600 gph reverse osmosis water purification unit has been service approved and will be procured commencing in FY81.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 12 December 1978
Exploratory development	Completed
Milestone 1	ADM 12 December 1978
Advanced development	Completed
Milestone 2	ADM 12 December 1978
Full-scale development	Completed
Milestone 3	ADM 28 November 1979

FUNDING

Funding has been established as a follow-on effort to determine water distribution within a MAF. No hardware is contemplated.

Funding Status ($000)							
FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
20	15	15	15	15	15	15	110

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SOIL STABILIZATION MODULE (AMSS)
Line Item No. 38
R&D Project No. —Not applicable
Date: 1 December 1980

STATUS

All R&D efforts directly related to the Advanced Multipurpose Surface System (AMSS) have been completed. Milestone 3 is dependent upon the delivery of a procurement data package from CEL. An environmental assessment regarding the toxicity of the sprayed chemicals is pending. The Environmental Health Center (Norfolk, Virginia) is currently reviewing this issue.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 24 April 1979
Exploratory development	Completed
Milestone 1	ADM 24 April 1979
Advanced development	Completed
Milestone 2	ADM 24 April 1979
Full-scale development	Completed
Milestone 3	2nd Quarter FY81

FUNDING

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: FIREFIGHTING EQUIPMENT
Line Item No. 39
R&D Project No. C0079/C0078-X
Date: 1 December 1980

STATUS

A specific requirement for firefighting equipment needs to be articulated. Modularized equipment either physically or remotely controlled must be determined based upon potential usage. Dedicated vehicular equipment also is a possibility that requires addressal. The projected milestone schedule cannot be considered with reasonable confidence until such requirements are forthcoming.

Milestone Status	
Program definition	2nd Quarter FY81
Milestone 0	3rd Quarter FY81
Exploratory development	4th Quarter FY82
Milestone 1	1st Quarter FY83
Advanced development	4th Quarter FY83
Milestone 2	1st Quarter FY84
Full-scale development	4th Quarter FY85
Milestone 3	1st Quarter FY86

FUNDING

Funding is adequate to support the project. Funding in FY84 and FY85 reflects test item procurement and data package preparation respectively.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
25	55	125	200	125	50	50	630

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Unassigned	
Development Project Officer:	CWO 4 N. Wilson	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: SANITATION UNIT
Line Item No. 40
R&D Project No. C0078-D
Date: 1 December 1980

STATUS

A palletized prototype has been fabricated at CEL, which incorporated improvements based on the field tests at MCDEC in FY79. This newer unit will accommodate 50 men per day at a power cost of 10 kW. Additional development will address potential power savings by more efficiently using exhaust emissions, particularly in the evaporators. Testing of this prototype in FY82 will conclude DT/OT–I. Full DT/OT–II may be delayed if a test shelter is unavailable in FY82.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 8 March 1979
Exploratory development	Completed
Milestone 1	ADM 8 March 1979
Advanced development	1st Quarter FY81
Milestone 2	2nd Quarter FY81
Full-scale development	1st Quarter FY83
Milestone 3	4th Quarter FY83

FUNDING

Funding is adequate provided additional test item procurements are not contemplated. However, a preproduction model is planned to be fabricated in FY81. Funds may have to be increased to satisfy this requirement, as well as additional funds to house the unit in a standard Marine Corps shelter.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
73	53	60	80	50	50	50	416

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	M/Gy/Sgt. D. Sumner	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: COMBINED LAUNDRY AND BATH UNIT
Line Item No. 41
R&D Project No. C0078-D
Date: 1 December 1980

STATUS

The milestone schedule is considered to be optimistic. Ideal circumstances, i.e., no development setbacks and a concentrated engineering effort, will be mandatory for the schedule to be met. Additionally, the 1-year test period for full-scale engineering development assumes an ideal R&D environment. Efforts to date have not reflected this environment. The laundry has been partially fabricated. Integration with a drying unit has not been accomplished. A wastewater recycling process also remains to be defined. Power requirements, as currently envisioned, approach 180 kW.

Milestone Status

Program definition	Completed
Milestone 0	ADM 1 November 1979
Exploratory development	Completed
Milestone 1	ADM 1 November 1979
Advanced development	1st Quarter FY82
Milestone 2	2nd Quarter FY82
Full-scale development	1st Quarter FY84
Milestone 3	2nd Quarter FY84

FUNDING

Funding is supportive of the program. However, the project should transition to a 6.4 level in FY82, provided scheduled milestones are maintained.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
170	124	140	237	125	50	50	896

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	M/Gy/Sgt. D. Sumner	(703) 640-2021
Operational Test Project Officer:	Capt. J. Hindenburg	(703) 640-3141
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: DUMP MODULE
Line Item No. 42
R&D Project No. C0078-H
Date: 1 December 1980

STATUS

Efforts to date have centered upon a survey of commercial equipment and techniques, as well as their applicability for Marine Corps use. Specific Marine Corps requirements cannot be articulated until a suitable host vehicle has been identified for the module. The schedule is responsive to a FY86 initial procurement which is predicated upon the identification of host vehicles by the 3rd quarter FY81. (See items 21 and 23.)

Milestone Status	
Program definition	3rd Quarter FY81
Milestone 0	3rd Quarter FY81
Exploratory development	3rd Quarter FY84
Milestone 1	4th Quarter FY84
Advanced development	4th Quarter FY85
Milestone 2	1st Quarter FY86
Full-scale development	3rd Quarter FY86
Milestone 3	3rd Quarter FY86

FUNDING

Funding is supportive of this program. This project should transition to the 6.4 level in FY85.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
1	1	1	208	150	10	10	381

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. D. Gee	(202) 695-3041
Development Project Officer:	Capt. A. Schuler	(703) 640-2245
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: REFRIGERATION SYSTEM
Line Item No. 43
R&D Project No. C0079-G
Date: 1 December 1980

STATUS

The 8'x8'x10' insulated box has been ISO certified and is ready for service approval. Componentry for the refrigerator/freezer unit that did not successfully pass DT/OT-I have been redesigned and will be evaluated during DT/OT-II in FY81. Initial DT/OT-II has indicated a high probability that remaining tests will be completed successfully on time.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 17 May 1979
Exploratory development	Completed
Milestone 1	ADM 17 May 1979
Advanced development	Completed
Milestone 2	ADM 17 May 1979
Full-scale development	4th Quarter FY81
Milestone 3	1st Quarter FY82

FUNDING

The funding profile is responsive to this DOD-sponsored project.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
5	5	5	5	5	5	5	35

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	CEC Coleman	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	NARADCOM (MCLnO)	(617) 653-2410

Element: MEPDIS
Line Item No. 44
R&D Project No. C0079-A
Date: 1 December 1980

STATUS

MEPDIS R&D efforts encompass three major subtasks: a 60 Hz expeditionary power distribution system, packaging of the 60 Hz expeditionary power distribution system, and a 400 Hz expeditionary power distribution system. The milestone status reflects planned R&D for the 60 Hz system only. Further, MEPDIS should not be considered as the host system for any other potential electrical equipment project, i.e., floodlight towers and field wiring harness, even though known interfaces (common couplers and connectors) will exist.

Milestone Status	
Program definition	Completed
Milestone 0	ADM 1 November 1976
Exploratory development	Completed
Milestone 1	Not applicable
Advanced development	Completed
Milestone 2	Not applicable
Full-scale development	Completed
Milestone 3	ADM 12 January 1977

FUNDING

Funding for MEPDIS reflects the 60 Hz packaging, the 400 Hz distribution, the floodlight tower, and the wiring harness projects. Funding requirements for the 60 Hz distribution package have been completed.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
62	50	71	68	50	50	50	401

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	1/Lt. Sellers	(202) 697-3664
Development Project Officer:	CEC Coleman	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: AIR CONDITIONERS
Line Item No. 45
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

No air conditioner R&D is required in view of the existence and acceptability of the standard units. Future R&D, if required, will be performed in consonance with DOD-sponsored programs.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Not applicable.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	1/Lt. Sellers	(202) 697-0129
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: ELECTRIC GENERATORS
Line Item No. 46
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

No R&D efforts for new generators are planned in view of the suitability of the existing family of standard generators. Future R&D, if required, will be performed in consonance with DOD-sponsored programs.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	1/Lt. Sellers	(202) 697-0129
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: BULK LAUNDRY UNIT
Line Item No. 47
R&D Project No. C0079-A
Date: 1 December 1980

STATUS

The Army has reconfigured a laundry unit consisting of a washer, extractor, dryer, and generator onto a $1\frac{1}{2}$-ton trailer. All equipments are basically adaptations from commercial lines. Marine Corps efforts will involve packaging of these items, less the generator, into a standardized shelter or container, most likely with a 8'x8'x10' dimension for a single unit.

Milestone Status	
Program definition	Completed
Milestone 0	1st Quarter FY81
Exploratory development	1st Quarter FY81
Milestone 1	1st Quarter FY81
Advanced development	3rd Quarter FY81
Milestone 2	4th Quarter FY81
Full-scale development	1st Quarter FY83
Milestone 3	3rd Quarter FY83

FUNDING

Funding is adequate to support this program.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
94	63	57	53	50	25	25	367

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	M/Gy/Sgt. D. Sumner	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	NARADCOM (MCLnO)	(617) 653-2410

Element: BATH/SHOWER UNIT
Line Item No. 48
R&D Project No. C0079-A
Date: 1 December 1980

STATUS

A determination needs to be made as to whether this will be a product improvement program (PIP) or a new R&D initiative. A strong candidate is the M-1958 portable shower unit which has been product improved by the Army. If a PIP is selected, the project should be opened as a 2.6 level effort. As such, a new R&D project number would have to be assigned. Another alternative could adopt the shower unit currently being developed at CEL. This shower employs an electric heater for hot water.

Milestone Status	
Program definition	Completed
Milestone 0	2nd Quarter FY81
Exploratory development	2nd Quarter FY81
Milestone 1	2nd Quarter FY81
Advanced development	2nd Quarter FY81
Milestone 2	2nd Quarter FY81
Full-scale development	4th Quarter FY81
Milestone 3	1st Quarter FY82

FUNDING

Funding appears adequate to support this program.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
33	24	27	20	20	20	20	164

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	CEC Coleman	(703) 640-2021
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: FIELD FEEDING SYSTEM
Line Item No. 49
R&D Project No. C0079-G
Date: 1 December 1980

STATUS

A prototype galley has been fabricated in one rigid and two knockdown 8'x8'x20' shelters. This unit completed most of the DT/OT-I objectives at MCDEC during FY80. Results of that testing will be addressed at the Milestone II review during FY81. Of concern are the power requirements. Should an alternate system (fuel-fired) be adopted, the milestone schedule may not have to be significantly altered. Fuel-fired prototypes are available at NARADCOM. As currently projected, the milestone schedule for an all-electric galley is considered to be optimistic. The availability of test shelters could be a problem if they are required in FY82.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	2nd Quarter FY81
Advanced development	2nd Quarter FY81
Milestone 2	2nd Quarter FY81
Full-scale development	3rd Quarter FY83
Milestone 3	4th Quarter FY83

FUNDING

The funding profile is responsive so long as this remains a DOD-sponsored project.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
5	5	5	5	5	5	5	35

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Ms. C. Paquette	(202) 695-3072
Development Project Officer:	Gy. Sgt. S. Jackson	(703) 640-3352
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	NARADCOM (MCLnO)	(617) 653-2410

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: BAKERY SYSTEM
Line Item No. 50
R&D Project No. C0079-G
Date: 1 December 1980

STATUS

Development efforts for a bakery system have been limited to monitoring the division size unit (16,000 pounds per day) being fabricated at NARADCOM for the Army. The project essentially involves the placement of commercial equipment into ISO containers/shelters. Actual hardware development for a MAB-size bakery is scheduled to commence in FY82 at NARADCOM.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	4th Quarter FY81
Advanced development	1st Quarter FY83
Milestone 2	2nd Quarter FY83
Full-scale development	2nd Quarter FY84
Milestone 3	3rd Quarter FY84

FUNDING

The funding profile is responsive so long as this remains as a DOD-sponsored project.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
5	5	5	5	5	5	5	35

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Ms. C. Paquette	(202) 695-3072
Development Project Officer:	Gy. Sgt. S. Jackson	(703) 640-3352
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	NARADCOM (MCLnO)	(617) 653-2410

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: SCRAPER, EARTHMOVING
Line Item No. 51
R&D Project No. C0078-A
Date: 1 December 1980

STATUS

This project is primarily centered upon a survey of commercial industry to identify suitable (commercial) candidates as replacement for current equipment. However, it may be difficult to justify a unilateral Marine Corps effort in view of the Army's efforts at the Mobility Equipment Research and Development Command (MERADCOM) with similar equipment. The Marine Corps' contention that the Army uses larger and heavier equipment than required may not justify a unilateral acquisition effort.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	2nd Quarter FY81
Milestone 3	4th Quarter FY82

FUNDING

Funding is adequate to support this program.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
25	10	20	30	30	40	40	195

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Lt. Col. T. Cucina	(202) 697-0129
Development Project Officer:	Maj. M. Nereim	(703) 640-2021
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: TRACTOR, FULL-TRACKED
Line Item No. 52
R&D Project No. C0078-A
Date: 1 December 1980

STATUS

This project is primarily centered upon the test and evaluation of commercial engineer equipment in order to identify candidate items to replace the TEREX 82-30. Several candidates have been evaluated and a MCDEC report is pending.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	2nd Quarter FY81
Milestone 3	4th Quarter FY81

FUNDING

Funding is adequate to support this program.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
25	10	25	35	35	40	40	210

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Lt. Col. T. Cucina	(202) 697-0129
Development Project Officer:	Maj. M. Nereim	(703) 640-2021
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	MCDEC	

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: LUBRICATION SERVICE UNIT
Line Item No. 53
R&D Project No.—Not applicable
Date: 1 December 1980

STATUS

There is no R&D effort currently underway with the lubrication service unit. Current equipment is skid-mounted and includes tanks, pump, compressors, hoses, and fittings. Future development and replacement will probably be accomplished on a component-by-component basis. The open shipping frame will eventually house this unit.

Milestone Status	
Program definition	Not applicable
Milestone 0	Not applicable
Exploratory development	Not applicable
Milestone 1	Not applicable
Advanced development	Not applicable
Milestone 2	Not applicable
Full-scale development	Not applicable
Milestone 3	Not applicable

FUNDING

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Not applicable ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. D. Gee	(202) 695-3041
Development Project Officer:	Not applicable	
Operational Test Project Officer:	Not applicable	
Development Activity/Agency:	Not applicable	

Element: STEAM CLEANER UNIT
Line Item No. 54
R&D Project No. C0075-B
Date: 1 December 1980

STATUS

A prototype steam cleaner has undergone evaluation at MCDEC. It is basically a commercially available product and will cost significantly less than a militarized version. Efforts in FY81 will include an expanded operational test period and could include its emplacement in an open shipping frame.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	4th Quarter FY81
Milestone 2	3rd Quarter FY83
Full-scale development	3rd Quarter FY84
Milestone 3	1st Quarter FY85

FUNDING

Funding is not supportive of any Marine Corps unilateral test item procurement. However, test items are expected to be provided by the Army.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
15	10	5	5	5	5	5	50

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. J. James	(202) 695-3041
Acquisition Project Officer:	Maj. D. Gee	(202) 695-3041
Development Project Officer:	Gy Sgt. D. Boehm	(703) 640-2245
Operational Test Project Officer:	1/Lt. W. Miller	(703) 640-3286
Development Activity/Agency:	ARRCOM	

Element: AMPHIBIOUS ASSAULT FUEL SYSTEM (AAFS)
Line Item No. 55
R&D Project No. C0078-F
Date: 1 December 1980

STATUS

The AAFS is operational and no R&D effort is underway to replace the system. However, under the bulk fuel program, R&D is being conducted on the beach interface unit, adaptive pumping controls, new longer lengths of 6-inch line, new fittings, componentry packaging in ISO containers, and other means of on-shore storage.

Milestone Status	
Program definition	Not applicable
Milestone 0	Not applicable
Exploratory development	Not applicable
Milestone 1	Not applicable
Advanced development	Not applicable
Milestone 2	Not applicable
Full-scale development	Not applicable
Milestone 3	Not applicable

FUNDING

Funding cannot be accurately monitored due to the roll-up of many subtasks in the bulk fuel program. Consequently, adequacy of funding either on a general program overview or an individual subtask basis cannot be realistically evaluated.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
157	185	250	250	375	475	475	2,167

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	CWO 4 N. Wilson	(703) 640-2021
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

FIELD LOGISTICS SYSTEM RESEARCH AND DEVELOPMENT

Element: TACTICAL AIRFIELD FUEL DISPENSING SYSTEM (TAFDS)
Line Item No. 56
R&D Project No. C0078-F
Date: 1 December 1980

STATUS

TAFDS is a subset of AAFS. No specific R&D is underway to replace this system. However, TAFDS will be improved as many of its components are replaced as a result of the R&D efforts associated with the bulk fuel program.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding associated with the R&D of TAFDS components is included in the bulk fuel program and is reflected in the funding status of item 55.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Completed ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	CWO 4 N. Wilson	(703) 640-2021
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

Element: HELICOPTER EXPEDIENT REFUELING SYSTEM (HERS)
Line Item No. 57
R&D Project No. C0078-F
Date: 1 December 1980

STATUS

HERS is operational and no R&D is currently planned to replace the system. However, under the bulk fuel program, a new higher capacity pump is being developed in consonance with the requirements of newer aircraft.

Milestone Status	
Program definition	Completed
Milestone 0	Completed
Exploratory development	Completed
Milestone 1	Completed
Advanced development	Completed
Milestone 2	Completed
Full-scale development	Completed
Milestone 3	Completed

FUNDING

Funding associated with the R&D of HERS components is included in the bulk fuel program and is reflected in the funding status of item 55.

Funding Status ($000)

FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	Total
------ Completed ------							

PRINCIPALS

Acquisition Sponsor Project Officer:	Lt. Col. M. Felske	(202) 697-6950
Acquisition Project Officer:	Maj. E. Wages	(202) 697-0129
Development Project Officer:	CWO 4 N. Wilson	(703) 640-2021
Operational Test Project Officer:	Capt. J. Hindenberg	(703) 640-3141
Development Activity/Agency:	CEL, Port Hueneme (MCLnO)	(805) 982-4189

CHAPTER 3

EQUIPMENT INTRODUCTION AND DISPOSAL

3.1 INTRODUCTION

The FLS hardware, as presently defined, consists of five major subsystems: container, shelter, motor transport, material handling equipment, and service support. Currently, a total of 57 separate line items are included in the subsystems. A principal concern is that due consideration is given to the various interrelationships which exist in planning for the introduction of FLS hardware to the field. This is imperative in order to prevent a degradation of operational readiness that could result from an improperly sequenced or imbalanced introduction and disposal of equipments. Of equal importance is scheduling the introduction of new equipment in such a manner that it takes maximum economic advantage of the remaining useful service life of the equipment being replaced.

This chapter contains the plan for the orderly introduction of FLS items into FMF units, logistic bases, and appropriate formal schools, plus the concomitant disposal of items being replaced, where applicable. The plan identifies the FLS item allowances within respective organizations, the equipment and quantities being replaced, and the phase-in/phase-out quantities scheduled by fiscal year. It further provides a brief outline of the procurement cycle in terms of intra-HQMC (I&L) involvement and procedures which each FLS element scheduled for procurement must follow prior to delivery.

3.2 ACQUISITION CONSIDERATIONS

As a matter of policy in the acquisition of FLS items, Marine Corps procurement will give primary consideration to use of off-the-shelf commercial hardware or its adaptation to military needs whenever feasible. Full advantage will be taken of the manufacturer's warranties and maintenance services. Training devices and engineering documentation, when applicable, as well as factory training or local training at key field installations by manufacturer's representatives, may also be provided. Commercial specifications will be upgraded where necessary to avoid degradation of the item's mission profile. As a means of extending an item's life expectancy, rebuild at a DOD Manager's facility, or possible contractor rebuild, will be considered every 7 years. This is a reasonable interval to keep pace with model and parts changes, thus avoiding the stockage of obsolescent support items while

capitalizing on technological improvements within industry. The fielding of commercial equipments supported by manufacturer's warranties, the location of dealerships, and appropriate repair parts stockage will be considered provided commercial usage data indicate reliability in satisfying service and parts requirements. This policy, emphasizing the procurement of commercial items that are militarily suitable, is in keeping with the guidance issued by the Office of Management and Budget in May 1976, and by the Congress in a June 1979 (House Appropriations Committee Report 95–151).

3.3 FLS INTRODUCTION-DISPOSAL COORDINATION

FLS equipment introduction efforts will be coordinated through the organizations depicted in figure 3–1. The respective ASPO within the Concepts and Requirements Office initiates the fielding plan for particular items and should be briefed when major departures from such plans are necessitated. The distribution of allowances, the timely phased introduction of FLS equipment, and the concurrent disposal of obsolescent equipment being replaced by FLS items is the detailed responsibility of the APO. This responsibility covers all FLS matters affecting the Fleet Marine Force (active and reserve) and includes training equipment allowances at the Marine Corps Service Support Schools and Engineer School, Camp Lejeune, North Carolina.

Introduction of new equipment will be direct from the manufacturer to the operating forces or via the logistic bases. In either case, the method for introduction will be directed by the Deputy Chief of Staff, Installations and Logistics, and coordinated by the Concepts and Requirements Office (C&RO) through the ASPO having responsibility for the particular commodity. Although not indicated in figure 3–1, the C&RO will also coordinate with MCDEC, Quantico, Virginia, and Landing Force Training Commands, Pacific and Atlantic, regarding the FLS impact on combat/logistics support doctrines and training/readiness to ensure effective management, operation, and maintenance of FLS elements, subsystems, and the total system.

3.4 FLS PROCUREMENT PROCESS

Introduction

The FLS procurement process extends from the time the procurement decision is made at a Marine Corps System Acquisition Review Council (MSARC) meeting or an equivalent in-progress review (IPR) decision, as appropriate, to the Marine Corps support date (MSD) of the item. Activities prior to the procurement authorization are considered to be principally developmental and IOT&E related. Activities are considered to be operational

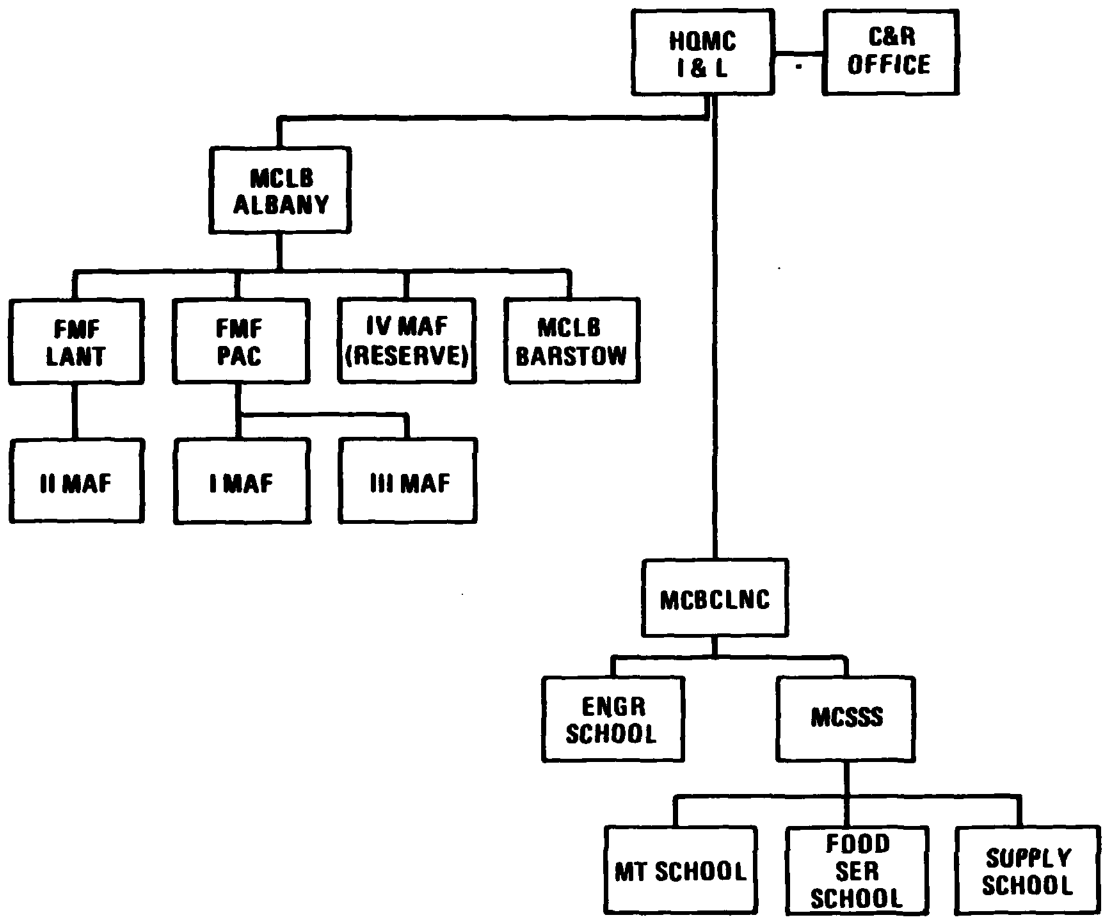


Figure 3-1. Coordination Chart

after the MSD. Procurement is initiated when the requisite PMC or O&MMC funding is authorized and appropriated. It normally terminates when the contract is fulfilled.

Procedure

Several organizations within the Installations and Logistics Department of HQMC are directly involved in the procurement process. The C&RO (Code LM-2) is responsible for overall implementation of the program. The Procurement Division (Code LB) is responsible to effect and supervise direct procurement of material and services, to provide procurement staff and assistance to I&L Division, and to establish and accomplish necessary internal and external procurement liaison with DON, DOD, and other government agencies.

Additionally, the Engineer/Motor Transport/General Supply Branch (Code LME) provides specialized logistics input required for the development, acquisition, and management of cognizant material. Finally, the Material Acquisition Support Branch (Code LMA) provides requisite logistics management support services to monitor/control the requirements, acquisition, analysis/review, technical data, configuration, publications, support equipment, and budget/financial/materiel execution for new equipment.

Key events in the procurement process include, but are not limited to, procurement package preparation, issuance of the request for proposal/invitation for bid (RFP/IFB), contract award, contract performance monitoring, first article test and acceptance, and full-scale production. The procurement package preparation, an extensive task in itself, is coordinated and accomplished by the APO. This includes the formulation of a procurement work order with data item requirements and a technical data package. The data package consists of drawings and specifications plus performance certification and quality assurance requirements.

The FLS item procurement cycles were examined in order to determine when a proposed replacement item would be available to meet the requirements of one MAF and be fully supportable for operational use (in-service). To do this, it was necessary to program these items through a conceptual acquisition cycle based on an assumed budget and estimated production period.

The major thrust of this effort was to achieve an orderly replacement of equipments at the most advantageous time economically without adversely affecting the readiness posture of the units involved. This dictated that the items being replaced be evaluated as to their life-cycle status, including the effects of rebuild/repair on their life expectancy. The next step was to analyze the proposed acquisition schedule and, by combining the schedule with economic considerations, to determine the best time to accomplish the transition. It was also necessary to take into account the dependencies of the new equipments to avoid

inconsistencies with sound operational logic. In instances where this was unavoidable, interim alternatives were established.

Figure 3–2 is the procurement and cost schedule for all FLS elements. Based on this funding schedule and on the in-service dependency network matrix presented in chapter 4, a procurement milestone matrix was developed (figure 3–3). The matrix indicates key events in the procurement of each element and the time when the event should be accomplished, along with the organizations responsible for initiating the event.

3.5 OPERATIONAL DEPENDENCY RELATIONSHIPS

The FLS element interdependencies have been identified in order to provide an orderly transition during their introduction. In addition, these dependencies reflect the item functional relationships during:

- Staging and marshaling of equipment and supplies in the deployment phase
- Intermodal transit to the amphibious objective area, including:
  - -- road, rail, and air movement to the port of embarkation
  - -- air and surface movement to the AOA
  - -- air or road movement to the prospective operational facility
- Unloading and distribution of supplies and equipment ashore
- Establishment and operation of functional facilities ashore

These dependencies, illustrated in chapter 4, are indicative of the explicit functional relationships existing during deployment and subsequent operations, and serve as basic parameters for the total logistics concept of operations.

In the event that specific element acquisition milestones are changed, dependency ramifications require immediate review. These include an analysis to determine:

- Appropriate new delivery dates for items having a primary dependency
- Effects of extending the service life of old equipment
- Utilization of other equipment which has a dependency on the delayed element
- Effects on the funding profiles for revised procurements

Operational readiness of affected units is a paramount consideration when scheduling or milestone changes are contemplated.

3.6 EQUIPMENT INTRODUCTION

The FLS Procurement and Cost Schedule, figure 3–2, also serves as an overall guide to the introduction sequence. This sequence keys to the procurement dates, in that the

FIELD LOGISTIC SYSTEM PROCUREM

UNIT COST : 82 DOLLARS **QUANTITY SHOWN IN UNITS**

#	UNIT COST ITEM $(000)	ELEMENT DESCRIPTION	FY 79 QTY	FY 79 $(000)	FY 80 QTY	FY 80 $(000)	FY 81 QTY	FY 81 $(000)	FY 82 QTY	FY 82 $(000)	FY 83 QTY	FY 83 $(000)	FY 84 QTY	FY 84 $(000)	FY 85 QTY	FY 85 $(000)	FY 86 QTY	FY 86 $(000)	FY 87 QTY	FY 87 $(000)	FY 88 QTY	FY 88 $(000)	FY 89 QTY	FY 89 $(000)
1	.05	INSERT									5,306	265	5,306	265	5,348	267	5,348	267	4,799	240	4,799	2[illegible]	5,048	252
2	.623 / .068	FALCON									3,212 / 509	2,001 / 35	3,090 / 510	1,925 / 35	3,105 / 507	1,934 / 35	3,104 / 508	1,934 / 35	2,830 / 458	1,763 / 32	2,830 / 458	1,7[illegible]	2,947 / 472	1,836 / 33
3	2.5 / .378	QUADCON									1,513 / 62	3,783 / 23	1,441 / 62	3,603 / 23	1,459 / 64	3,648 / 24	1,452 / 63	3,630 / 24	1,328 / 56	3,320 / 21	1,328 / 56	3,3[illegible] / 21	1,381 / 61	3,453 / 23
4	——	CONTAINER 8x8x20																						
5	6.0	FLATRACK 8x8x20							410	2,080	678	4,068	160	960	190	1,140	346	2,076						
6	7.2	FLATRACK 8-1/2x8x40							75	460	490	3,528			96	691	80	576	32	230				
7	4.0	SHIPPING FRAME 8x8x10							*127	470	96	384	118	472	118	472	118	472	108	432	54	216	54	216
8	2.24	SHIPPING FRAME 4x6-2/3x8											469	1,050	494	1,107	209	468	286	641	278	621	183	410
9	176.4	SHELTER 60x128	7	1,201			12	1,945			57	10,055	45	7,938	12	2,117	26	4,586	23	4,057				
10	59.8	SHELTER 32x73	42	2,377			58	3,173	60	3,577	56	3,349	34	2,033	36	2,153	79	4,724						
11	20.9	SHELTER 20x33	51	1,020			136	2,598	158	3,311	92	1,923	50	1,045	27	564	48	1,003	30	627				
12	28.4	SHELTER 8x8x20 KNOCKDOWN							142	4,031	421	11,956	858	24,367	311	8,832	441	12,524	645	18,318	862	24,4[illegible]	954	27,094
13	30.7	SHELTER 8x8x20 RIGID/GP							111	3,429	427	13,109	958	29,411	593	18,205	495	15,197	486	14,920	467	14,33[illegible]	458	14,061
14	36.2	SHELTER 8x8x20 EMI							56	2,038	33	1,195	68	2,462	94	3,403	14	507						
15	26.3	SHELTER 8x8x10 EMI							53	1,406	225	5,918	206	5,418	323	8,495	21	552			12	31[illegible]	144	3,787
16	13.1	SHELTER JOINING CORRIDOR 7x7x11							24	312	285	3,734	573	7,506	256	3,354	175	2,293	178	2,332	282	3,69[illegible]	305	3,996
17	4.6	SHELTER APPOINTMENTS							71	309	445	2,047	910	4,186	454	2,083	428	1,969	552	2,539	631	2,9[illegible]	681	3,133
18	22	HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV)							*414	10,780	2,912	73,300	2,075	51,100	1,790	46,400	1,812	49,700	977	21,494				
19	VARIES	HEAVY HIGH MOBILITY TACTICAL TRUCK (HHMTT)	467	25,834	271	14,000	1,145	71,300	615	42,955	660	49,158	782	54,800	1,037	69,247								
20	54.2	MEDIUM PRIME MOVER													127	8,153	130	8,346	140	8,988	144	9,24[illegible]		
21	109.3	HEAVY PRIME MOVER									100	10,930	110	12,023	110	12,023	102	11,149	101	11,039				
22	14.8	LOGISTICS TRAILER (12.5 TON)													254	3,759	265	3,922	275	4,070	246	3,6[illegible]		
23	20.6	LOGISTICS TRAILER (22.5 TON)									153	3,152	165	3,399	150	3,090	147	3,028	135	2,781				
24	16.3	MOBILIZER/TRANSPORTER											121	1,972										
25	57.3	SEMI TRAILER (65 TON)																	17	974				
26	43.2	ROUGH TERRAIN FORKLIFT (4,000 LB)			*93	579	*371	1,830																
27	77.9	ROUGH TERRAIN FORKLIFT (6,000 LB)	*100	4,600	41	2,000																		
28	125.9	ROUGH TERRAIN FORKLIFT (10,000 LB)	*129	8,800																				
29	179.9	ROUGH TERRAIN CRANE (30 TON)	*34	11,400																				
30	225.7	CONTAINER HANDLER											25	5,643										
31	109.3	LIGHTWEIGHT AMPHIBIOUS CONTAINER HANDLER (LACH)					56	5,700																
32	*	BRIDGING, DRY GAP							19/10/10	24,847	18/7/7	21,919	0/8/8	4,623										
33	*	BRIDGING, WET GAP											16	*										
34	3,700	MARINE CORPS ENVIRON. CONTROLLED MED. SYS. (MCEMS)									2	7,400	1	3,700	1	3,700								
35	7.6	FUEL/WATER STORAGE MODULE											326	2,478	326	2,478	156	1,186	158	1,201	156	1,18[illegible]	156	1,186
36	7.5	FUEL PUMP MODULE											53	398	46	345								
37	157.3	WATER PURIFICATION SYSTEM					38	6,023	127*	19,977	96	15,100	118	18,561	118	18,561	118	18,561	16	2,517				
38	77	SOIL STABILIZATION MODULE (AMSS)											15	1,155	15	1,155	3	231						
39	32	FIRE FIGHTING EQUIPMENT																	82	2,624	81	2,592		
40	6.3	SANITATION UNIT											933	5,878	933	5,878								
41	136	COMBINED LAUNDRY AND BATH UNIT											27	3,672	31	4,216								
42	12.2	DUMP MODULE															59	720	58	708				
43	*	REFRIGERATION SYSTEM							90	1,107	232	2,871	329	4,062	366	4,520	257	3,178	74	910				
44	130.8	MOBILE ELECTRIC POWER DISTRIBUTION SYSTEM (MEPDIS)					32	3,949	19	2,485														
45	VARIES	AIR CONDITIONERS	2,593	13,157	197	1,095	170	1,123	891	3,476	2,296	11,320	2,126	9,594	1,330	6,014	804	3,580	1,035	4,599	1,144	5,111	1,391	6,193
46	VARIES	ELECTRIC GENERATORS	1,555	28,284	236	4,179	208	3,922	1,113	11,994	1,020	22,196	1,511	24,994	860	10,055	501	15,826	197	4,852	192	4,652	198	4,845
47	32.7	BULK LAUNDRY UNIT											96	3,139	95	3,107								
48	19.6	BATH/SHOWER UNIT																						
49	296	MARINE CORPS FIELD FEEDING SYSTEM (MFFS)													34	10,064	33	9,768	33	9,768	35	10,36[illegible]		
50	816	BAKERY SYSTEM																	3	2,448	2	1,63[illegible]		
51	128.6	SCRAPER, EARTHMOVING									74	9,516												
52	140.7	TRACTOR, FULL-TRACKED									79	11,115	203	28,562										
53	28.3	LUBRICATION SERVICE UNIT									74	2,094	83	2,349	84	2,377	48	1,358						
54	6.9	STEAM CLEANER UNIT															65	449	62	428	99	683	89	614
55	1,064	AMPHIBIOUS ASSAULT FUEL SYSTEM (AAFS)							5*	5,320	4	4,256	5	5,320	6	6,384								
56	156.9	TACTICAL AIRFIELD FUEL DISPENSING SYSTEM (TAFDS)							*		8	1,255	8	1,255										
57	50	HELICOPTER EXPEDIENT REFUELING SYSTEM (HERS)																						
		TOTAL		96,673		21,853		101,563		144,364		312,955		341,376		280,055		183,839		128,873		91,0[illegible]		71,2[illegible]

△ SUM OF FY 82 – OUT YEAR COLUMNS -MPS PROCUREMENTS NOT INCLUDED - SEE ANNEX B

* AMPLIFYING COMMENTS

PROCUREMENT & COST SCHEDULE

TITY SHOWN IN UNITS

FY 87 QTY	FY 87 $(000)	FY 88 QTY	FY 88 $(000)	FY 89 QTY	FY 89 $(000)	FY 90 QTY	FY 90 $(000)	OUT YEAR QTY	OUT YEAR $(000)	TOTAL △ QTY	TOTAL △ $(000)	REMARKS
9	240	4,799	240	5,048	252	5,048	252			41,002	2,048	PROCUREMENT FUNDED VIA OMMC/OMMCR
	1,763 32	2,830 458	1,763 32	2,947 472	1,836 33	2,947 473	1,836 33			24,065 3,895	14,992 270	OMMC - PALCONS - 11,320K/RACKS - 204K. OMMCR - PALCONS - 3,672K/RACKS - 66K.
	3,320 21	1,328 56	3,320 21	1,381 61	3,453 23	1,380 61	3,450 23			11,282 485	28,207 182	PMC FUNDED
												LEASE - DOD GUIDANCE
										1,784	10,324	
	230									773	5,485	
	432	54	216	54	216	58	232			851	3,366	FLS QUANTITY ONLY. TOTAL QUANTITY IS 178 @ 659K
6	641	278	623	183	410	221	495	1,897	4,249	4,037	9,043	
	4,057							4	706	167	29,459	
										265	15,836	
	627									405	8,473	
5	18,318	862	24,481	954	27,094			1,480	42,032	6,114	173,635	
6	14,920	467	14,337	458	14,061			767	23,547	4,762	146,216	
								12	434	277	10,039	
		12	316	144	3,787					984	25,892	
78	2,332	282	3,694	305	3,996			468	6,131	2,546	33,352	
52	2,539	631	2,903	681	3,133			1,342	6,173	5,514	25,347	APPTS. TBD. SHELTER COMPLEXING KITS PROCUREMENT IS INCL
977	21,494									9,980	252,774	*FLS QUANTITY ONLY. TOTAL QUANTITY IS 812 @ 22.9M
										3,094	216,160	INCL CARGO, WRECKER, XLWB AND DUMP VEHS FOR FLS ONLY, MPS DETAILS IN APPENDIX D
140	8,988	144	9,245							541	34,732	
101	11,039									523	57,164	
275	4,070	246	3,641							1,040	15,392	
135	2,781									750	15,450	
										121	1,972	
17	974									17	974	
										—	—	*MOD KITS FOR EXISTING RTFs/RTF PROCUREMENT IS COMPLETED
										—	—	*FY78 BUY. FY82 MPS IS 90 @ 5,577K
												*FY78 BUY
												*FY73 BUY
										25	5,643	
										37/25/25	51,389	*UNIT COST IS 993K/ERECTION SET;COST IS 329.1K/ REINF SET;COST IS 248.7K
										16	*	*UNIT COST - TBD
										4	14,800	UNIT COST INCL REQ'D SHELTERS
156	1,201	156	1,186	156	1,186	156	1,186	1,655	12,578	3,089	23,479	UNIT COST DOES NOT INCL COST FOR 4'x6-2/3'x8' SHIPPING FRAME
						90	675	167	1,253	356	2,671	UNIT COST DOES NOT INCL COST FOR 4'x6-2/3'x8' SHIPPING FRAME
16	2,517									631	93,277	FLS QUANTITY ONLY. TOTAL QUANTITY IS 140 @ 22M. MPS QUANTITY IS 13.
										33	2,541	
82	2,624	81	2,592							163	5,216	
										1,866	11,756	
										58	7,888	
58	708									117	1,428	
74	910									1,348	16,648	*350 FT^3 BOX COST 12.3K. FY82 MPS QUANTITY IS 55/4,000 BTU REEFER COST 12.4K. FY82 MPS QUANTITY IS 200. SEE APPENDIX B
										19	2,485	
1,035	4,599	1,144	5,111	1,391	6,193	—	—	2,453	10,963	13,470	60,850	TOTAL QUANTITY REQ'D FOR A/C & SKID ASSY. INCL MPS REQUIREMENTS
197	4,852	192	4,652	198	4,845	—	—	388	9,471	5,980	108,885	TOTAL USMC REQ FOR GEN, FREQ. CONV, & DUMMY LD; INCL MPS REQ
										191	6,246	
								141	2,764	141	2,764	
33	9,768	35	10,360							135	39,960	UNIT COST INCL REQ'D SHELTERS. DOES NOT INCL GEN, REFRIG AND WATER MODS
3	2,448	2	1,632							5	4,080	UNIT COST INCL REQ'D SHELTERS
										74	9,516	FLS QUANTITY ONLY. TOTAL FY83 BUY IS 80 @ 10.3M. INCL 6 for MPS.
										282	39,677	FLS QUANTITY ONLY. FY82 BUY IS 14 @ 1.8M FOR MPS
										289	8,178	
62	428	99	683	89	614	77	531			392	2,705	
										20	21,280	*FLS QUANTITY ONLY.TOTAL QUANTITY IS 11 @ 11.7M IN FY82
										16	2,510	*10 SYSTEMS @ 1.6 M IN FY82 FOR MPS
												IN PRESENT INVENTORY. PROCUREMENT IS FOR COMPONENTS.
	128,873		91,048		71,332		8,713		120,301		1,882,656	

Figure 3-2. Procurement and Cost Schedule

DATE	SCHEDULED
(black box)	COMPLETED OR NOT REQUIRED

	ELEMENT DESCRIPTION	APPROVED FOR PROCUREMENT (MSARC III/IPR)	RFP/IFB RELEASED	CONTRACT AWARD	1ST ART TEST	FULL SCALE PRODUCTION	1ST DESTINATION DELIVERY	IN-SERVICE
	RESPONSIBLE ORGANIZATION	CMC/DC/S I&L	PROCURING ACTIVITY	PROCURING ACTIVITY	CARD CONTRACTOR	CONTRACTOR	LM	FMF COMMANDER
1	INSERT	4-82	2-83	3-83	1-84	1-84	2-84	4-84
2	PALCON	4-82	2-83	3-83	1-84	1-84	2-84	4-84
3	QUADCON	4-82	2-83	3-83	1-84	1-84	2-84	4-84
4	CONTAINER 8x8x20						AS REQUIRED	
5	FLATRACK 8x8x20		2-82	3-82	3-82	3-82	4-82	4-83
6	FLATRACK 8-1/2x8x40		2-82	3-82	3-82	3-82	4-82	4-83
7	SHIPPING FRAME 8x8x10	1-81	1-81	3-81	3-81	4-81	1-82	3-82
8	SHIPPING FRAME 4x6-2/3x8	1-81	1-84	2-84	4-84	4-84	1-85	3-85
9	SHELTER 60x120				2-81	2-81	4-82	3-83
10	SHELTER 32x73				2-81	2-81	4-82	3-83
11	SHELTER 20x33				2-81	2-81	3-82	2-83
12	SHELTER 8x8x20 KNOCKDOWN	4-81	3-82	4-82	2-83	2-83	4-83	3-84
13	SHELTER 8x8x20 RIGID/GP	4-81	2-82	4-82	3-83	3-83	4-83	1-85
14	SHELTER 8x8x20 EMI	4-81	3-82	4-82	2-83	2-83	4-83	1-85
15	SHELTER 8x8x10 EMI	4-81	3-82	4-82	2-83	2-83	4-83	1-85
16	SHELTER JOINING CORRIDOR 7x7x11	4-81	3-82	4-82	2-83	2-83	4-83	3-84
17	SHELTER APPOINTMENTS						AS REQUIRED	
18	HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV)	4-82	4-82	1-83	1-83	3-83	1-84	4-84
19	HEAVY HIGH MOBILITY TACTICAL TRUCK (HHMTT)		1-81	2-81	1-82	2-82	2-82	1-83
20	MEDIUM PRIME MOVER	1-85	1-85	2-85	3-85	3-85	2-86	2-86
21	HEAVY PRIME MOVER	2-83	2-83	3-83	1-84	1-84	4-84	4-84
22	LOGISTICS TRAILER (12.5 TON)	1-85	1-85	2-85	3-85	3-85	2-86	2-86
23	LOGISTICS TRAILER (22.5 TON)	2-83	2-83	3-83	1-84	1-84	4-84	4-84
24	MOBILIZER/TRANSPORTER	4-83	1-84	2-84	3-84	3-84	4-84	4-84
25	SEMITRAILER (65 TON)	4-85	1-87	2-87	2-87	2-87	2-88	2-89
26	ROUGH TERRAIN FORKLIFT (4,000 LB)			2-81	3-81	3-81	3-81	1-82
27	ROUGH TERRAIN FORKLIFT (6,000 LB)							1-82
28	ROUGH TERRAIN FORKLIFT (10,000 LB)							2-81
29	ROUGH TERRAIN CRANE (30 TON)							
30	CONTAINER HANDLER	4-83	2-84	3-84	4-84	4-84	1-85	3-85
31	LIGHTWEIGHT AMPHIBIOUS CONTAINER HANDLER (LACH)		2-81	4-81	4-81	1-82	2-82	1-83
32	BRIDGING, DRY GAP		1-82	2-82	3-82	4-82	2-83	4-83
33	BRIDGING, WET GAP	4-83	4-83	2-84	3-84	3-84	4-84	4-85
34	MARINE CORPS ENVIRONMENT-CONTROLLED MEDICAL SYSTEM (MCEMS)	3-81	1-82	2-82	4-82	4-82	1-83	3-83
35	FUEL/WATER STORAGE MODULE	4-82	1-84	2-84	4-84	4-84	2-85	3-85
36	FUEL PUMP MODULE	4-81	1-84	2-84	4-84	4-84	2-85	3-85
37	WATER PURIFICATION SYSTEM		2-81	3-81	4-81	1-82	3-82	3-82
38	SOIL STABILIZATION MODULE (AMSS)	2-81	1-84	2-84	3-84	1-85	1-85	3-85
39	FIREFIGHTING EQUIPMENT	1-86	1-87	2-87	4-87	4-87	2-88	3-88
40	SANITATION UNIT	4-83	1-84	2-84	3-84	3-84	4-84	3-85
41	COMBINED LAUNDRY AND BATH UNIT (CLABU)	2-84	3-84	3-84	4-84	4-84	2-85	3-85
42	DUMP MODULE	3-86	4-86	4-86	2-87	2-87	3-87	3-87
43	REFRIGERATION SYSTEM	1-82	2-82	3-82	1-83	2-83	3-83	3-83
44	MOBILE ELECTRIC POWER DISTRIBUTION SYSTEM (MEPDIS)		2-81	2-81	4-81	4-81	2-82	3-82
45	AIR CONDITIONERS							
46	ELECTRIC GENERATORS							
47	BULK LAUNDRY UNIT	3-83	4-83	4-83	1-84	1-84	2-84	1-85
48	BATH/SHOWER UNIT	1-82	TBD	TBD	TBD	TBD	TBD	TBD
49	MARINE CORPS FIELD FEEDING SYSTEM (MFFS)	4-83	1-84	2-84	3-84	4-84	2-85	4-85
50	BAKERY SYSTEM	3-84	1-86	2-86	3-86	4-86	1-87	4-87
51	SCRAPER, EARTHMOVING	4-82	2-83	3-83	4-83	4-83	2-84	3-84
52	TRACTOR, FULL TRACKED	4-81	2-82	3-82	4-82	4-82	2-83	3-83
53	LUBRICATION SERVICE UNIT	4-81	4-81	1-82	2-82	2-82	4-82	2-83
54	STEAM CLEANER UNIT	1-85	1-86	2-86	3-86	3-86	1-87	2-87
55	AMPHIBIOUS ASSAULT FUEL SYSTEM (AAFS)							
56	TACTICAL AIRFIELD FUEL DISPENSING SYSTEM (TAFDS)							
57	HELICOPTER EXPEDIENT REFUELING SYSTEM (HERS)							

Figure 3-3. Procurement Milestone Matrix

subsequent timing of equipment availability for in-service use can vary considerably from contract award to its available-for-issue date. This variance generally is caused by the nonavailability of provisioning support in the time frames desired. The procurement and cost schedule anticipates a contract awarded within the first two quarters of the fiscal year indicated. Production and transportation times are additional considerations for introduction scheduling.

3.7 PHASE-IN

Phase-in of the FLS items considers several factors germane to both the new item and the one being replaced. These factors are in addition to the effect a particular item may have upon other items within the FLS and include the following:

- Operational advantage over the item to be replaced
- Operational advantage as a new item in the inventory (does not replace any item)
- Operational dependency on another element or elements within the system
- Critical operational deficiency
- Precedence relationship with another item or items in the system
- Provisioning support level attained at the time of introduction
- Age, condition, and life-cycle utility of items to be replaced
- Training readiness to use and maintain the item

Assuming the above factors are favorable, the impact of introduction on individual FMF units essentially becomes a follow-on equipment type consideration. The FLS equipment phase-in date, as defined for this Plan, has been established 1 year after the production contract award date. The phase-in date was determined to be that point in time when FLS equipment would be inducted into the inventory. These dates are not necessarily synonymous with in-service dates that are predicated upon the attainment of specific provisioning levels and other support factors.

3.8 GUIDELINES

Two generally accepted alternatives for equipment introduction form the procedural baseline. The first alternative, and the one most commonly used, is for the end items to be delivered to the logistic bases and held there until such time as the IO is attained and the item is fully supportable. When a decision is made by the FMF Commander to place the item in service, using units would receive requisitioning instructions or the items would automatically be issued. The second alternative is given in table 3-1. When it is determined that an excessive period of time would elapse before the Marine Corps IO could be

achieved, the issue priority on a MAF-by-MAF basis of a particular item would be established as indicated in table 3-1. This ensures that the initial issue, float, and PWR requirements are met for an entire MAF before the outfitting of another MAF commences. In this manner, the risk of readiness degradation is reduced from that which would occur if a MAF were provided with a portion of the initial issue without regard to full support requirements.

Table 3-1. Equipment Introduction Priority

Priority	Type Unit	MAF	Issue Designation
1	Division	II	Initial Issue FSSGFloat WingPWR (Albany)
2	Division	I	Initial Issue FSSGFloat WingPWR (Barstow) Training*
3	Division	III	Initial Issue FSSGFloat WingPWR (Barstow) Training*
4	Division	IV	Initial Issue (Limited) FSSGFloat (Albany, Barstow) WingPWR (Albany, Barstow) Training*

* Introduction of assets for active forces training (supporting schools) and reserve unit training (selected organizations) use will precede placing large quantities of end items into service use or reserve storage.

3.9 SHELTER REPLACEMENT PRIORITY

The quantity of shelters required by the Marine Corps and the current items being replaced were determined by an analysis of the MCESS qualitative/quantitative requirements update. In order to properly develop a phase-in plan for MCESS, it was necessary first to develop a priority system because of the quantities required, their associated cost, and the requirement to develop a generally level procurement funding program. Factors considered in the development of shelter introduction priorities included the MCESS item characteristics, the replaced item characteristics, the function served, and the particular MAF involved.

The establishment of a priority system for the implementation of shelters required an analysis of MCESS items on two levels. The first involved MCESS items that replace current hard shelters (i.e., shop vans, communications, and shelters) and the second pertained to shelters that replace soft shelters (tents) or that are new assets.

In cases involving the replacement of hard shelters, projected wear-out/exit-dates were determined and MCESS item(s) were programmed for procurement in the corresponding year. Because small shelters will not be available until 1983–84 and because of POM limitations, some current shelter replacement requirements have been delayed.

Due to the large numbers of MCESS items replacing tentage, it was necessary to establish functional area priorities. A detailed rationale for priority assignment is contained in appendix D to this plan. The functional areas include communications-electronics, maintenance, supply, medical, dental, and operations/administrative.

In addition to functional area priorities, an additional priority on a MAF-by-MAF basis was established for those instances where an entire function could not be purchased in the same year due to level funding requirements or POM limitations. The MAF priority sequence is the same as that outlined in table 3–1.

Once the hard-to-hard shelter conversions and functional area requirements were computed using the established priorities in conjunction with the shelters requirements update study, it was necessary to establish a generally level funding procurement program. To do this, the hard-to-hard conversions were initially scheduled for procurement based on the projected wear-out date of the replaced shelter. However, compliance with that premise created an erratic funding profile since the preponderance of these items would be acquired in 1982 and 1985. To correct the erratic funding profile, some soft-to-hard shelter requirements were phased in by year, beginning in 1982, in accordance with their priorities until level funding was established. In this regard, it should be noted that shelter acquisitions scheduled for 1979 and 1981, prior to development of the level procurement funding plan, were treated as advance acquisitions of future requirements.

Where POM allocations restricted the planned phase-in (appendix D), shelters that could not be purchased were equitably added to the requirement for subsequent FY buys. In those cases where the POM allocations allowed an advance buy, the quantities required to meet the planned phase-in, by fiscal year, were adjusted accordingly. Where a planned phase-in required a buy for a minimal quantity of shelters in any fiscal year, the requirements were consolidated with the preceding year's buy. The detailed phase-in schedule, displaying the unit, type shelter, quantity, and replaced item, is given in appendix D.

3.10 DUAL MAINTENANCE REQUIREMENT

The stockage of a wide range of repair parts to provide a dual maintenance capability in support of both new and old equipments could prove necessary, and would have a detrimental impact on limited Marine Corps resources were the attainment of equipment IOs not accomplished in a timely manner. Also, storage and transportation costs accrue when new equipment is held at a central point until a sufficient quantity is obtained for proper outfitting of a MAF. Hence, the adherence to approved procurement plans is of operational and economic importance.

3.11 IN-SERVICE

The scheduled in-service date is indicated in section 1 of the Letter of Adoption and Procurement (LAP). This date can be changed if the FMF Commander or the Commanding General MCLB, Albany states that the equipment can be placed in service earlier, provided provisioning criteria are satisfactorily met and training is complete. Conversely, if provisioning is deficient, it would be the responsibility of MCLB, Albany, to inform CMC that the in-service date should be delayed. Final responsibility to place the item in-service or to delay the in-service date rests with CMC.

3.12 PHASE-OUT

The container, motor transport, material handling equipment, and service support phase-in/phase-out tables are structured after the descriptive case printouts provided periodically by HQMC. Table 3-2 gives the phase-out schedule of equipment being replaced by the FLS. Table 3-2 subheadings are defined as follows:

- Initial available assets reflect the inventory position of the new item and current items at the beginning of the fiscal years shown in the columns.
- The phase-out figures reflect the schedule for disposal of current assets based on projection of item condition and normal utilization.
- The phase-in figures reflect gains to inventory, primarily from the procurement of new items or, in some cases, from a rebuild of existing items.
- Final available assets reflect the inventory position at the end of the fiscal years shown.
- Procurement quantities are based on buying to the post D-day objective.

3.13 INTRODUCTION-DISPOSAL CONSIDERATIONS

In all cases careful attention has been given to achieving the maximum utilization of current assets. This was done for reasons of efficiency and to maintain the best possible

readiness posture during the transition period. Phase-out schedules are based on best-available projections of the remaining service life of current equipments. In most cases, FLS equipment procurement and phase-in schedules have been extended to comply with consolidated budget guidance.

3.14 SHIPPING COSTS

With regard to the procurement of FLS equipment and support stocks, transportation funding (case A) has been programmed for direct shipment to the using units. Funding also has been programmed to reflect delivery to the logistic bases. Case B transportation funding reflects shipment of all items to the logistic bases, with further shipment of initial issues to the using units programmed the following year. MCLB, Albany, Georgia, is to receive the major end items for one-half of IV MAF and the maintenance float (MF), operational readiness float (ORF), and Prepositioned War Reserve (PWR) items for II MAF. MCLB, Barstow, California, is to receive major end items for the remainder of IV MAF and the MF, ORF, and PWR items for I MAF and III MAF. Each logistic base will receive one-half of the MF, ORF, and PWR for IV MAF. For program costing purposes, manufacturer location was considered as being the Detroit, Michigan, area. Coordination with the Navy to provide shipment to units outside CONUS will be pursued. To ensure that sufficient support has been included, funding for transportation by Military Sealift Command shipping is included. Case A transportation cost for FLS is $56 million, and $59 million for case B. A more detailed shipping cost narrative with supporting computations is presented in appendix B.

Table 3-2. Phase-In/Phase-Out Schedules

Container Subsystem
(Elements 1–8)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
1 Insert	180 Day IO 41,002				60 Day IO 41,002					Issue Qty 41,002				
	0	0	0	0	0	5,306	5,306	5,348	5,348	4,799	4,799	5,048	5,048	0
2 PALCON	180 Day IO 24,065				60 Day IO 24,065					Issue Qty 24,065				
	0	0	0	0	0	3,212	3,090	3,105	3,104	2,830	2,830	2,947	2,947	0
PALCON Rack	180 Day IO 3,895				60 Day IO 3,895					Issue Qty 3,895				
	0	0	0	0	0	509	510	507	508	458	458	472	473	0
3 QUADCON	180 Day IO 11,326				60 Day IO 11,282					Issue Qty 11,218				
	0	0	0	0	0	1,513	1,441	1,459	1,452	1,328	1,328	1,381	1,380	0
QUADCON Rack	180 Day IO 485				60 Day IO 485					Issue Qty 485				
	0	0	0	0	0	62	62	64	63	56	56	61	61	0
4 Container 8' x 8' x 20'	To be obtained as required													
5 Flatrack 8' x 8' x 20'	180 Day IO 1,855				60 Day IO 1,784					Issue Qty 1,759				
	0	0	0	0	410	678	160	190	346	0	0	0	0	0
6 Flatrack 8' x 8' x 40'	180 Day IO 797				60 Day IO 773					Issue Qty 757				
	0	0	0	0	75	490	0	96	80	32	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
7 Shipping Frame 8' x 8' x 10'*	180 Day IO 851				60 Day IO 851					Issue Qty 724				
	0	0	0	0	127	96	118	118	118	108	54	54	58	0
8 Shipping Frame 4' x 6 2/3' x 8'	180 Day IO 4,177				60 Day IO 4,037					Issue Qty 3,716				
	0	0	0	0	0	0	469	494	209	286	278	183	221	1,897

*Does not include 51 that are programmed in FY82 for MPS.

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Shelter Subsystem

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92

See Appendix D

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Motor Transport Subsystem

High Mobility Multipurpose Wheeled Vehicle (HMMWV)

180 Day IO 11,458 60 Day IO 10,222 Issue Qty 9,354

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
18 **Initial Available Assets**														
Truck, 5/4-ton, HMMWV (D1158)	0	0	0	0	0	656	3,568	5,643	7,433	9,245	10,222	10,222		
Truck, ¼-ton, M151A2 (D1160)	8,932	9,089	7,877	6,647	5,614	4,799	4,339	2,763	1,263	0	0	0		
Truck, ¼-ton, Amb., M718A1 (D0890)	186	236	196	125	124	94	69	44	19	0	0	0		
Truck, 1¼-ton, Amb., M792 (D1000)	150	140	132	124	116	108	0	0	0	0	0	0		
Truck, Cargo, 1¼-ton, M561 (D1020)	1,393	1,325	1,260	1,198	1,139	450	0	0	0	0	0	0		
Total	10,661	10,790	9,465	8,094	6,993	6,107	7,976	8,450	8,715	9,245	10,222	10,222		
Phase Out (Losses)														
Truck, ¼-ton, M151A2 (1160)	1,180	1,212	1,230	1,033	815	460	1,576	1,500	1,263	0	0	0		
Truck, ¼-ton, Amb., M718A1 (D0890)	75	40	71	1	30	25	25	25	19	0	0	0		
Truck, 1¼-ton, Amb., M792 (D1000)	10	8	8	8	8	108	0	0	0	0	0	0		
Truck, Cargo, 1¼-ton, M561 (D1020)	68	65	62	59	689	450	0	0	0	0	0	0		
Total	1,333	1,325	1,371	1,101	1,542	1,043	1,601	1,525	1,282	0	0	0		
Phase In (Gains)														
Truck, 5/4-ton, HMMWV (D1158)	0	0	0	0	656	2,912	2,075	1,790	1,812	977	0	0		
Truck, ¼-ton, 151A2 (1160)	1,337	0	0	0	0	0	0	0	0	0	0	0		
Truck, ¼-ton, Amb., M718A1 (D0890)	125	0	0	0	0	0	0	0	0	0	0	0		
Truck, 1¼-ton, Amb., M792 (D1000)	0	0	0	0	0	0	0	0	0	0	0	0		
Truck, 1¼-ton, Cargo, M561 (D1020)	0	0	0	0	0	0	0	0	0	0	0	0		
Total	1,462	0	0	0	656	2,912	2,075	1,790	1,812	977	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
18 (Continued)														
<u>Final Available Assets</u>	10,790	9,465	8,094	6,993	6,107	7,976	8,450	8,715	9,245	10,222	10,222	10,222		
<u>Shortfall (Overage) (Reference Full IO)</u>	(568)	757	2,128	3,229	4,115	2,246	1,772	1,507	977	0	0	0		
<u>Procurement</u>	0	0	0	656	2,912	2,075	179	1,812	977	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Heavy High-Mobility Tactical Truck (HHMTT)

Cargo, 5-Ton

180 Day IO 4,999*   60 Day IO 4,474*   Issue Qty 4,124*

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
19 <u>Initial Available Assets</u>														
Truck, Cargo, 5-ton M923	0	0	0	0	1,131	1,777	2,261	2,888	3,798	3,798	3,798	3,798	3,798	3,798
Truck, Cargo, 5-ton, M813	0	0	405	676	676	676	676	676	676	676	676	676	676	676
Truck, Cargo, 2½-ton, M35A2C	2,562	2,407	2,262	1,307	785	248	0	0	0	0	0	0	0	0
Truck, Cargo, 2½-ton, M36A2	341	348	336	325	221	148	142	136	0	0	0	0	0	0
Truck, Cargo, 5-ton, M54A2C	1,330	1,057	986	839	709	604	482	383	190	0	0	0	0	0
Total	4,233	3,812	3,989	3,147	3,522	3,453	3,561	4,083	4,664	4,474	4,474	4,474	4,474	4,474
<u>Phase Out (Losses)</u>														
Truck, Cargo, 2½-ton, M35A2C	155	145	955	522	537	248	0	0	0	0	0	0	0	0
Truck, Cargo, 2½-ton, M36A2	13	12	11	104	73	6	6	136	0	0	0	0	0	0
Truck, Cargo, 5-ton, M54A2C	273	71	147	130	105	122	99	193	190	0	0	0	0	0
Total	441	228	1,113	756	715	376	105	329	190	0	0	0	0	0
<u>Phase In (Gains)</u>														
Truck, Cargo, 5-ton, M923	0	0	0	1,131	646	484	627	910	0	0	0	0	0	0
Truck, Cargo, 2½-ton, M36A2	20(R)**		0	0	0	0	0	0	0	0	0	0	0	0
Truck, Cargo, 5-ton, M813	0	405	271	0	0	0	0	0	0	0	0	0	0	0
Total	20	405	271	1,131	646	484	627	910	0	0	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
19 (Continued)														
Final Available Assets	3,812	3,989	3,147	3,522	3,453	3,561	4,083	4,664	4,474	4,474	4,474	4,474	4,474	4,474
Shortfall (Overage) (Reference Full IO)	662	485	1,327	952	1,021	913	391	(190)	0	0	0	0	0	0
Procurement														
Truck, Cargo, 5-ton, M923	0	0	1,131	646	484	627	910	0	0	0	0	0	0	0
Truck, Cargo, 5-ton, M813	405	271	0	0	0	0	0	0	0	0	0	0	0	0
Total	405	271	1,131	646	484	627	910	0	0	0	0	0	0	0

* Includes 492 MPS Vehicles

**(R) — Rebuild

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Heavy High-Mobility Tactical Truck

Wrecker, 5-Ton

180 Day IO 297*   60 Day Proc. Obj. 265*   Issue Qty 249*

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
19 (Continued)														
Initial Available Assets														
Wrecker, 5-ton, M936/M816	0	0	0	49	49	137	223	265	265	265				
Wrecker, 5-ton, M543A2	252	294	303	289	200	96	85	77	35	0				
Total	252	294	303	338	249	233	308	342	300	265				
Phase Out (Losses)														
Wrecker, 5-ton, M543A2	21	15	14	89	104	11	8	42	35	0				
Phase In (Gains)														
Wrecker, M936/M816	0	0	49	0	88	86	42	0	0	0				
Wrecker, M543A2	** 63 (R)		24 (R)		0	0	0	0	0	0	0	0		
Total	63	24	49	0	88	86	42	0	0	0				
Final Available Assets	294	303	338	249	233	308	342	300	265	265				
Shortfall (Overage) (Ref. Full IO)	(29)	(38)	(73)	16	32	(43)	(77)	(35)	0	0				
Procurement	49	0	0	83	86	42	0	0	0	0				

* Includes 19 MPS Vehicles

**(R) — Rebuild

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Heavy High-Mobility Tactical Truck (HHMTT)
Extra-Long Wheelbase, 5-Ton

180 Day IO 274   60 Day IO 243*   Issue Qty 228**

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
19 (Continued)														
Initial Available Assets														
Truck, Cargo, 5-ton XLWB M928	0	0	0	0	14	72	135	196	230	230	230	230	230	230
Truck, Cargo, 5-ton XLWB M814	0	0	0	13	13	13	13	13	13	13	13	13	13	13
Truck, Cargo, 5-ton LWB M55A2	20	19	18	16	14	7	5	3	0	0	0	0	0	0
Total	20	19	18	29	41	92	153	212	243	243	243	243	243	243
Phase Out (Losses)														
Truck, Cargo, 5-ton, LWB M55A2	1	1	2	2	7	2	2	3	0	0	0	0	0	0
Phase In (Gains)														
Truck, Cargo, 5-ton XLWB M928	0	0	0	14	58	63	61	34	0	0	0	0	0	0
Truck, Cargo, 5-ton XLWB M814	0	0	13	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	13	14	58	63	61	34	0	0	0	0	0	0
Final Available Assets	19	18	29	41	92	153	212	243	243	243	243	243	243	243
Shortfall (Overage) (Ref. Full IO)	224	225	214	202	151	90	31	0	0	0	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
19 (Continued)														
Procurement														
Truck, Cargo, 5-ton, XLWB M814	13	0	0	0	0	0	0	0	0	0	0	0	0	0
Truck, Cargo, 5-ton, XLWB M928	0	0	14	58	63	61	34	0	0	0	0	0	0	0
Total	13	0	14	58	63	61	34	0	0	0	0	0	0	0

* Includes four MPS vehicles

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Heavy High-Mobility Tactical Truck (HHMTT)
Dump Truck, 5-Ton

180 Day IO 212* 60 Day IO 203* Issue Qty 197*

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
19 (Continued)														
Initial Available Assets														
Truck, Dump, 5-ton, M929	0	0	0	0	31	58	110	203	203	203	203	203	203	203
Truck, Dump, 5-ton, M51A2	625	638	646	620	592	387	240	162	0	0	0	0	0	0
Total	625	638	646	620	623	445	350	365	203	203	203	203	203	203
Phase Out (Losses)														
Truck, Dump, 5-ton, M51A2	48	27	26	28	205	147	78	162	0	0	0	0	0	0
Phase In (Gains)														
Truck, Dump, 5-ton, M929	0	0	0	31	27	52	93	0	0	0	0	0	0	0
Truck, Dump, 5-ton, M51A2	61(R)	35(R)	0	0	0	0	0	0	0	0	0	0	0	0
Total	61	35	0	31	27	52	93	0	0	0	0	0	0	0
Final Available Assets	638	646	620	623	445	350	365	203	203	203	203	203	203	203
Shortfall (Overage) (Ref. Full IO)	(435)	(443)	(417)	(420)	(242)	(147)	(162)	0	0	0	0	0	0	0
Procurement	0	0	0	31	27	52	93	0	0	0	0	0	0	0

(R)—Rebuild

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Medium Prime Mover

180 Day IO 586 60 Day IO 541 Issue Qty 513

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
20 **Initial Available Assets**														
Medium Prime Mover	0	0	0	0	0	0	0	0	127	257	397	541	541	541
Truck, Tractor, 5-ton, M818	0	0	0	47	179	385	422	524	712	751	601	358	179	0
Truck, Tractor, 5-ton, M52A2T (D1130)	594	567	527	491	348	245	152	74	0	0	0	0	0	0
Total	594	567	527	538	527	630	574	598	839	1,008	998	899	720	541
Phase Out (Losses)														
Truck, Tractor, 5-ton, M818	0	0	0	0	0	0	0	0	0	150	243	179	179	0
Truck, Tractor, 5-ton, M52A2	42	40	36	143	103	93	78	74	0	0	0	0	0	0
Total	42	40	36	143	103	93	78	74	0	150	243	179	179	0
Phase In (Gains)														
Medium Prime Mover	0	0	0	0	0	0	0	127	130	140	144	0	0	0
Truck, Tractor, 5-ton, M818/M931	0	0	47	132	206	37	102	186	39	0	0	0	0	0
Truck, Tractor, 5-ton, M52A2	15	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	15	0	47	132	206	37	102	315	169	140	144	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
20 (Continued)														
Final Available Assets	567	527	538	527	630	574	598	839	1,008	998	899	541	0	0
Shortfall (Overage) (Ref. Full IO)	19	59	48	59	(44)	12	(12)	(253)	(422)	(412)	(313)	45	0	0
Procurement														
Medium Prime Mover, 9-ton	0	0	0	0	0	0	127	130	140	144	0	0	0	0
ruck Tractor, 5-ton, M818/M913	47	0	132	206	37	102	188	39	0	0	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Heavy Prime Mover

180 Day IO 564 60 Day IO 523 Issue Qty 494

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
21 **Initial Available Assets**														
Heavy Prime Mover	0	0	0	0	0	0	100	210	320	422	523	523		
Truck Tractor, 10-ton, 123E2	21	23	21	19	17	15	14	13	12	11	10	0		
Truck Tractor, 10-ton, 123A1C	119	119	96	78	50	40	30	20	10	0	0	0		
Total	140	142	117	97	67	55	144	243	342	433	533	523		
Phase Out														
Truck Tractor, 10-ton, 123E2	2	2	2	2	2	1	1	1	1	1	10	0		
Truck Tractor, 10-ton, 123A1C	0	23	18	28	10	10	10	10	10	0	0	0		
Total	2	25	20	30	12	11	11	11	11	1	10	0		
Phase In														
Heavy Prime Mover	0	0	0	0	0	100	110	110	102	101	0	0		
Truck Tractor, 10-ton, 123E2	4(R)	0	0	0	0	0	0	0	0	0	0	0		
Total	4	0	0	0	0	100	110	110	102	101	0	0		
Final Available Assets	142	117	97	67	55	144	243	342	433	533	523	523		
Shortfall (Overage) (Ref. Full IO)	422	447	467	497	509	420	321	222	131	31	41	41		
Procurement	0	0	0	0	100	110	110	102	101	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Logistics Trailer, 12.5-Ton

180 Day IO 1,117 60 Day IO 1,040 Issue Qty 989

22	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
Initial Available Assets														
Logistics Trailer, 12.5-ton (D0876)	0	0	0	0	0	0	0	0	254	519	794	1,040		
Chassis, Trailer, 3.5-ton, M353 (3.23:1) (D0080)	800	730	665	605	550	500	455	415	215	0	0	0		
Semitrailer, 6-ton, 2-wheel, M118A1 (1:1) (D0250)	197	154	120	94	74	57	45	36	26	0	0	0		
Trailer, Cargo, 1½-ton, M105 (10:1) (D0860)	133	123	114	106	99	92	85	78	0	0	0	0		
Trailer, Utility, 2½-ton, 4-wheel, F2-A (5:1) (D0885)	32	29	25	21	17	12	8	0	0	0	0	0		
Total	1,162	1,036	924	826	740	661	593	529	495	519	794	1,040		
Phase Out (Losses)														
Chassis, Trailer, 3.5-ton, M353 (D0080)	70	65	60	55	50	45	40	200	215	0	0	0		
Semitrailer, 6-ton, 2-wheel, M118A1 (D0250)	43	34	26	20	17	12	9	10	26	0	0	0		
Trailer, Cargo, 1½-ton, M105 (D0860)	10	9	8	7	7	7	7	78	0	0	0	0		
Trailer, utility, 2½-ton, 4-wheel (D0885)	3	4	4	4	5	4	8	0	0	0	0	0		
Total	126	112	98	86	79	68	64	288	241	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
22 (Continued)														
Phase In														
Logistics Trailer, 12.5-ton (D0876)	0	0	0	0	0	0	0	254	265	275	246	0		
Final Available Assets	1,036	924	826	740	661	593	529	495	519	794	1,040	1,040		
Shortfall (Overage) (Ref. Full IO)	81	193	291	377	456	524	588	622	598	323	77	77		
Procurement	0	0	0	0	0	0	254	265	275	246	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Logistics Trailer, 22.5-Ton

180 Day IO 804 60 Day IO 750 Issue Qty 714

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
23 Initial Available Assets														
Logistics Trailer, 22.5-ton	0	0	0	0	0	0	153	318	468	615	750	750		
Semitrailer, Refueler, 5,000-gal., M	282	282	281	280	279	278	277	276	275	274	273	0		
Semitrailer, Low Bed, 25-ton, M172A1	139	127	115	101	87	72	56	39	0	0	0	0		
Semitrailer, Flatbed, 12-ton, M127A26	606	591	576	561	547	534	380	224	80	0	0	0		
Total	1,027	1,000	972	942	913	884	866	857	823	898	1,023	750		
Phase Out (Losses)														
Semitrailer, Refueler, 5,000-gal.	0	1	1	1	1	1	1	1	1	1	273	0		
Semitrailer, Low Bed, 25-ton, M172A1	12	12	14	14	15	16	17	39	0	0	0	0		
Semitrailer, Flatbed, 12-ton, M127A26	15	15	15	14	13	154	156	144	80	0	0	0		
Total	27	28	30	29	29	171	174	184	81	1	273	0		
Phase In (Gains)														
Logistics Trailer, 22.5-ton	0	0	0	0	0	153	165	150	147	135	0	0		
Final Available Assets	1,000	972	942	913	884	866	857	823	898	1,023	750	750		
Shortfall (Overage) (Ref. Full IO)	(196)	(168)	(138)	(109)	(80)	(62)	(53)	(19)	(94)	(219)	54	54		
Procurement	0	0	0	0	153	165	150	147	135	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Motor Transport

Items Not Otherwise Controlled

Item	Relates To	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89
Initial Available Assets												
Semitrailer, Repair, Shop Van, M750 (D0270)	12.5-ton Log Tr/Shelter	80	76	72	68	64	60	57	54	0	0	0
Semitrailer, Van, Expandable, M313 (D0290)	12.5-ton Log Tr/Shelter	98	82	83	69	57	47	39	33	0	0	0
Semitrailer, Van, Refr., 7½-ton, M349A4 (D0308)	12 5-ton Log Tr/Refrig.	11	9	7	5	3	3	3	3	0	0	0
Trailer, Amphib. Cargo, ¼-ton, M416 (D0840)	5/4-ton HMMWV	2,784	2,934	3,458	3,353	3,205	2,580	2,428	2,331	1,721	1,211	0
Trailer, Cargo, 3/4-ton, M101A1 (D0850)	12.5-ton Log Tr/5-ton Tr	343	271	214	170	134	100	83	66	0	0	0
Trailer, Flatbed, 3/4-ton, M762 (D0875)	12.5-ton Log Tr/5-ton Tr	1,393	1,363	2,061	2,035	2,020	1,980	1,942	1,904	1,869	1,835	1,535
Trailer, Tank Water, M149A1 (D0880)	22.5-ton Log Tr/Module	1,274	1,137	1,111	1,097	1,085	1,074	958	855	805	755	705
Truck, Cargo, 1¼-ton Comm. M880 (D1015)	5/4-ton HMMWV	1,227	1,215	1,162	1,144	730	330	3	0	0	0	0
Truck, Firefighting, MC1051 (D1080)	None	67	57	72	48	33	26	20	15	10	5	0
Truck, Firefighting, Brush, M530CB (D1084)	M939 Chassis	71	71	70	68	67	65	65	65	65	65	0
Truck, Firefighting, Structural M530CS (D1685)	M939 Chassis	16	16	16	15	15	15	14	14	14	14	0
Truck, Multi-Stop, Rpr. Prts, 1¼-ton M893 (D1087)	None	159	156	153	150	147	144	93	84	0	0	0
Truck, Telephone Maint., 2½-ton M876 (D1091)	None	25	25	25	25	24	22	19	16	16	16	16

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Item	Relates To	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89
Initial Available Assets (Continued)												
Truck, Platform, ½-ton M274A5 505(D1100)417	None	2,434	1,433	941	818	705	601	505	417	208	0	0
Truck, Tank, Fuel, 1,200-gal. M49A2C (D1110)	Med. Pr. Mvr/12.5-ton Log Tr/Module	262	313	319	307	290	189	147	95	65	45	30
Truck, Tank, Water, 1,000-gal. M50A2 (D1120)	Med. Pr. Mvr/12.5-ton Log Tr/Module	119	136	142	139	136	133	93	100	60	30	0
Truck, Van, 2½-ton, M109A3 (D1190)	Med. Pr. Mvr/12.5-ton Log Tr/Shelter	203	208	205	202	199	115	33	33	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Mobilizer/Transporter

180 Day IO 121 60 Day IO 121 Issue Qty 121

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
24 Initial Available Assets														
Mobilizer/Transporter	0	0	0	0	0	0	0	121	121	121	121	121		
Phase Out (Losses)[1]														
Phase In Gains														
Mobilizer/Transporter	0	0	0	0	0	0	121	0	0	0	0	0		
Final Available Assets	0	0	0	0	0	0	121	121	121	121	121	121		
Shortfall (Overage)[1]														
Procurement														
Mobilizer/Transporter	0	0	0	0	0	121	0	0	0	0	0	0		

[1] N/A New Item

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Semitrailer, 65-Ton

180 Day IO 17 60 Day IO 17 Issue Qty 17

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
25														
Initial Available Assets														
Semitrlr, Lowbed, 65-ton Equipment Trans. (D0225)	0	0	0	0	0	0	0	0	0	0	17	17		
Semitrlr, Tank Trans., 65-ton M793 (D0220)	27	25	20	17	22	19	16	14	12	10	0	0		
Total	27	25	20	17	22	19	16	14	12	10	17	17		
Phase Out (Losses)														
Semitrlr, Tank Trans, 65-ton M793 (D0220)	2	7	10	7	3	3	2	2	2	10	0	0		
Phase In (Gains)														
Semitrlr, Lowbed, 65-ton Equipment Trans. (D0225)	0	0	0	0	0	0	0	0	0	17	0	0		
Semitrlr, Tank Trans., 65-ton M793 (D0220)	0	2	7	12	0	0	0	0	0	0	0	0		
Total	0	2	7	12	0	0	0	0	0	17	0	0		
Final Available Assets	25	20	17	22	19	16	14	12	10	17	17	17		
Shortfall (Overage) (Reference Full IO)	(8)	(3)	0	(5)	(2)	1	3	5	7	0	0	0		
Procurement	0	0	0	0	0	0	0	0	17	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Material Handling Subsystem
(Elements 26–31)
Fork Lifts

	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
	180 Day IO 412		60 Day IO 387		Issue Qty 370							
26 <u>Phase In (Gains)</u>												
4,000-lb (B2565) Modification Kits	93*	371*	0	0	0	0	0	0	0	0	0	0
	180 Day IO 613		60 Day IO 534		Issue Qty 511							
27 <u>Phase In (Gains)</u>												
6,000-lb (B2560)	41	0	0	0	0	0	0	0	0	0	0	0
	180 Day IO 406		60 Day IO 364		Issue Qty 334							
28 <u>Phase In (Gains)</u>												
10,000-lb (B2465)	0	0	0	0	0	0	0	0	0	0	0	0

* Quantities represent modification kits

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

MHE

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
			180 Day IO 189		60 Day IO 174		Issue Qty 166							
29 Phase In (Gains) 30-ton Crane	0	0	0	0	0	0	0	0	0	0	0	0	0	
			180 Day IO 25		60 Day IO 25		Issue Qty 25							
30 Phase In (Gains) Container Handler	0	0	0	0	0	0	25	0	0	0	0	0	0	
			180 Day IO 56		60 Day IO 56		Issue Qty 56							
31 Phase In (Gains) LACH	0	0	0	56	0	0	0	0	0	0	0	0	0	

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Service Support Subsystem

(Elements 31-56)

Bridging, Dry Gap

180 Day IO 37 60 Day IO 37 Issue Qty 37

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
32														
Initial Available Assets														
MGB	0	0	0	0	0	19	37	37	37	37	37	37	37	37
Bridge Fixed Highway, Type 60, Mod M-6 (B0140)[1]	28	28	28	28	28	14	0	0	0	0	0	0	0	0
Phase Out (Losses)														
Bridge Fixed Highway, M-6	0	0	0	0	14	14	0	0	0	0	0	0	0	0
Phase In (Gains)														
MGB	0	0	0	0	19	18	0	0	0	0	0	0	0	0
Final Available Assets	28	28	28	28	33	37	37	37	37	37	37	37	37	37
Shortfall (Overage)[2]	9	9	9	9	4	0	0	0	0	0	0	0	0	0
Procurement														
MGB	0	0	0	19	18	0	0	0	0	0	0	0	0	0

1 The 240-foot M-6 bridge will be replaced by the 100-foot MGB. On hand assets of M-6 have been converted to MGB equivalents. Final available assets, shortfall, and procurement are expressed as 100-foot MGB.

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Bridging, Wet Gap

180 Day IO 16 60 Day IO 16 Issue Qty 16

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
33														
Initial Available Assets														
MGB	0	0	0	0	0	0	0	16	16	16	16	16	16	16
Bridge, Fixed, Floating Type 60, mod M4T 6 (B0150)[1]	13	13	13	13	13	13	0	0	0	0	0	0	0	0
Phase Out (Losses)														
Bridge Fixed, Floating, M4T6	0	0	0	0	0	0	13	0	0	0	0	0	0	0
Phase In (Gains)														
MGB	0	0	0	0	0	0	16	0	0	0	0	0	0	0
Final Available Assets	13	13	13	13	13	13	16	16	16	16	16	16	16	16
Shortfall (Overage)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Procurement														
MGB	0	0	0	0	0	16	0	0	0	0	0	0	0	0

[1] The 270-foot M4T6 bridge will be replaced by the 100-foot MGB (wet gap), but the MGB (dry gap) can also be employed, with support devices, for wet gap crossings to provide a crossing capability which will be equivalent to that which exists with the M4T6.

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

MCEMS

180 Day IO 4 60 Day IO 4 Issue Qty 4

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
34 **Initial Available Assets**														
MCEMS	0	0	0	0	0	0	2	3	4	4	4	4		
Phase Out (Losses)[1]														
Phase In (Gains)														
MCEMS	0	0	0	0	0	2	1	1	0	0	0	0		
Final Available Assets	0	0	0	0	0	2	3	4	4	4	4	4		
Shortfall (Overage)[2]	0	0	0	0	0	2	1	0	0	0	0	0		
Procurement														
MCEMS	0	0	0	0	2	1	1	0	0	0	0	0		

[1] Replaces Command Post Tent (C6390) and Gen. Purpose tent (C6410) Hospital Co., Med Bn FSSG

[2] Not applicable—This is a new system

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Fuel/Water Storage Module (Water)

180 Day IO 1,320 60 Day IO 1,255 Issue Qty 1,195

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
35														
Initial Available Assets														
Water Storage Module	0	0	0	0	0	0	0	163	326	482	640	796		
Water, Trlr, 400-gal. (D0880)	1,274	1,137	1,111	1,097	1,085	1,074	958	855	755	655	555	455		
Water, Trk, 1,000-gal. (D1120)	119	136	142	139	136	133	93	100	60	30	0	0		
Phase Out (Losses)														
Water, Trlr, 400-gal. (D0880)	137	26	14	12	11	116	103	100	100	100	100	150		
Water, Trk, 1,000-gal. (D1120)	3	3	3	3	3	40	3	40	30	30	0	0		
Phase In (Gains)														
Water Storage Module	0	0	0	0	0	0	163	163	156	158	156	156		
Water, Trlr, 400-gal. (D0880)	0	0	0	0	0	0	0	0	0	0	0	0		
Water, Trk, 1,000-gal. (D1120)	20	9	0	0	0	0	10	0	0	0	0	0		
Final Available Assets														
Water Storage Module	0	0	0	0	0	0	163	326	482	640	796	952		
Water, Trlr, 400-gal. (D0880)	1,137	1,111	1,097	1,085	1,074	958	855	955	655	555	455	305		
Water, Trk, 1,000-gal. (D1120)	136	142	139	136	133	93	100	60	30	0	0	0		
Shortfall (Overage)	(51)	(31)	(14)	1	15	171	137	114	88	60	4	(2)		
Procurement														
Water Storage Module	0	0	0	0	0	163	165	156	158	156	156	156		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Fuel/Water Storage Module (Fuel)

180 Day IO 1,769 60 Day IO 1,704 Issue Qty 1,609

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
35 (Continued)														
Initial Available Assets														
Fuel Storage Module	0	0	0	0	0	0	0	163	326	326	326	326		
Fuel, Semitrlr, 5,000-gal. (D0215)[1]	1,410	1,410	1,400	1,395	1,380	1,375	1,360	1,355	1,340	1,335	1,320	1,315		
Fuel, Trk, 1,200-gal. (D1110)	262	313	319	307	290	189	147	95	65	45	30	20		
Phase Out (Losses)														
Fuel Storage Module	0	0	0	0	0	0	0	0	0	0	0	0		
Fuel, Semitrlr, 5,000-gal. (D0215)[1]	0	10	5	15	5	15	5	15	5	15	5	15		
Fuel, Trk, 1,200-gal. (D1110)	21	19	18	17	101	42	52	30	20	15	10	10		
Phase In (Gains)														
Fuel Storage Module	0	0	0	0	0	0	163	163	0	0	0	0		
Fuel, Trk, 1,200-gal. (D1110)	72	25	6	0	0	0	0	0	0	0	0	0		
Final Available Assets														
Fuel Storage Module	0	0	0	0	0	0	163	326	326	326	326	326		
Fuel, Semitrlr, 5,000-gal. (D0215)[1]	1,410	1,400	1,395	1,380	1,375	1,360	1,355	1,340	1,335	1,320	1,315	1,300		
Fuel, Trk, 1,200-gal. (D1110)	313	319	307	290	189	147	95	65	45	30	20	10		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
35 (Continued)														
Shortage (Overage)[1]	(19)	(15)	2	34	140	197	91	(27)	(2)	28	43	68		
Procurement														
Fuel Storage Module	0	0	0	0	0	163	163	0	0	0	0	0		

[1] For comparison purposes D0215 changed to fuel module equivalents (1 D0215 = 5 modules)

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Fuel Pump Module

180 Day IO 1/ 60 Day IO 1/ Issue Qty 1/

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
36														
Initial Available Assets														
Fuel Pump Module	0	0	0	0	0	0	0	0	53	99	99	99		
Phase Out (Losses)[1]														
Phase In (Gains)														
Fuel Pump Module	0	0	0	0	0	0	0	53	46	0	0	0		
Final Available Assets	0	0	0	0	0	0	0	53	99	99	99	99		
Shortfall (Overage)[1]														
Procurement														
Fuel Pump Module	0	0	0	0	0	0	53	46	0	0	0	0		

[1] N/A phase in parallels and supports fuel storage module introduction

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Water Purification System

180 Day IO 631   60 Day IO 631   Issue Qty 504

37	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
Initial Available Assets														
ROWPU[1]	0	0	0	0	38	165	261	379	497	615	631	631	631	631
Water Purification, Erdalator 1,500-GPH (B2605)[2]	163	55	50	40	30	25	20	15	10	0	132	126	120	108
Water Purification, Erdalator 600-GPH (B2620)[2]	99	99	69	39	9	0	0	0	0	0	53	51	49	45
Water Purification, 1,500-GPH Frame-mounted (B2625)[2]	270	99	69	39	14	0	0	0	0	0	225	215	208	185
Distillation Unit, 200-GPH (U3080)[2]	55	55	40	25	15	10	5	0	0	0	12	10	7	0
Phase Out (Losses)														
Water Purification, Erdalator 1,500-GPH (B2605)[2]	108	5	10	10	5	5	5	5	10	0	6	6	12	20
Water Purification, Erdalator 600-GPH (B2620)[2]	0	30	30	30	9	0	0	0	0	0	2	2	4	10
Water Purification, 1,500-GPH Frame-Mounted (B2625)[2]	0	30	30	25	14	0	0	0	0	0	10	10	20	30
Distillation Unit, 200-GPH (U3080)[2]	0	15	15	10	5	5	5	0	0	0	2	3	7	0
Phase In (Gains)														
ROWPU	0	0	0	38	127	96	118	118	118	16	0	0	0	0
Water Purification, Erdalator 1,500-GPH (B2605)[2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Purification, Erdalator 600-GPH (B2620)[2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water Purification, 1,500-GPH Frame-Mounted (B2625)[2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Distillation Unit, 200-GPH (U3080)[2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
37 (Continued)														
Final Available Assets														
ROWPU	0	0	0	38	165	261	379	497	615	631	631	631	631	631
Water Purification, Erdalator 1,500-GPH (B2605)[2]	55	50	40	30	25	20	15	10	0	0	0	0	0	0
Water Purification, Erdalator 600-GPH (B2620)[2]	99	69	39	9	0	0	0	0	0	0	0	0	0	0
Water Purification, 1,500-GPH Frame-Mounted (B2625)[2]	99	69	39	14	0	0	0	0	0	0	0	0	0	0
Distillation Unit, 200-GPH (U3080)[2]	55	40	25	15	10	5	0	0	0	0	0	0	0	0
Shortfall (Overage) (Ref. Full IO)	323	403	488	525	431	345	237	124	16	0	0	0	0	0
Procurement														
ROWPU	0	0	0	127	96	118	118	118	16	0	0	0	0	0

1 Reverse osmosis water purification unit

2 Quantities shown have been converted to 600-GPH equivalents

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Soil Stabilization Module (AMSS)

180 Day IO 33 60 Day IO 33 Issue Qty 33

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
38 Initial Available Assets														
AMSS	0	0	0	0	0	0	0	15	30	33	33	33		
Phase Out (Losses)[1]														
Phase In (Gains)														
AMSS	0	0	0	0	0	0	15	15	3	0	0	0		
Final Available Assets	0	0	0	0	0	0	15	30	33	33	33	33		
Shortfall (Overage)[1]														
Procurement														
AMSS	0	0	0	0	0	15	15	3	0	0	0	0		

[1] N/A–New Item, may replace some Mo-Mat Assault Trackway Kits (B1220)

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Firefighting Equipment

180 Day IO 163 60 Day IO 163 Issue Qty 160

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
39 <u>Initial Available Assets</u>														
Firefighting Equipment	0	0	0	0	0	0	0	0	0	0	82	163		
Firefighting Trk ¼-t (D1080)	67	57	72	48	33	26	20	15	10	5	0	0		
<u>Phase Out (Losses)</u>														
Firefighting Trk ¼-t (D1080)[1]	16	12	24	15	7	6	5	5	5	5	0	0		
<u>Phase In (Gains)</u>														
Firefighting Equipment	0	0	0	0	0	0	0	0	0	82	81	0		
Firefighting Trk ¼-t (D1080)	6	27	0	0	0	0	0	0	0	0	0	0		
<u>Final Available Assets</u>														
Firefighting Equipment	0	0	0	0	0	0	0	0	0	82	163	163		
Firefighting Trk ¼-t (D1080)	57	72	48	33	26	20	15	10	5	0	0	0		
<u>Shortfall (Overage)</u>[1]														
<u>Procurement</u>														
Firefighting Equipment	0	0	0	0	0	0	0	0	82	81	0	0		

[1] N/A–Firefighting equipment represents a new item as well as replacement for D1080

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Sanitation Unit

180 Day IO 2,048 60 Day IO 1,866 Issue Qty 1,705

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
40 <u>Initial Available Assets</u>														
Sanitation Unit	0	0	0	0	0	0	0	933	1,866	1,866	1,866	1,866		
<u>Phase Out (Losses)</u>[1]														
<u>Phase In (Gains)</u>														
Sanitation Unit	0	0	0	0	0	0	933	933	0	0	0	0		
<u>Final Available Assets</u>	0	0	0	0	0	0	933	1,866	1,866	1,866	1,866	1,866		
<u>Shortfall (Overage)</u>[1]														
<u>Procurement</u>														
Sanitation Unit	0	0	0	0	0	933	933	0	0	0	0	0		

[1] N/A–New Item

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Combined Laundry and Bath

180 Day IO 62 60 Day IO 58 Issue Qty 53

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
41 <u>Initial Available Assets</u>														
CLABU	0	0	0	0	0	0	0	27	58	58	58	58		
Laundry Unit, Trailer-Mounted (B1225)[1]														
Bath Unit, Trailer-Mounted (B0060)[1]														
<u>Phase Out (Losses)</u>														
Laundry Unit, Trailer-Mounted (B1225)														
Bath Unit, Trailer-Mounted (B0060)														
<u>Phase In (Gains)</u>														
CLABU	0	0	0	0	0	0	27	31	0	0	0	0		
<u>Final Available Assets</u>														
CLABU	0	0	0	0	0	0	27	58	58	58	58	58		
<u>Shortfall (Overage)</u>[1]														
<u>Procurement</u>														
CLABU	0	0	0	0	0	27	31	0	0	0	0	0		

[1] CLABU replaces only those items allocated to Division Units (T/E N1363)--see Bulk Laundry Unit and Bath/Shower Unit for asset status.

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Dump Module

180 Day IO 117 60 Day IO 117 Issue Qty 117

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
42 **Initial Available Assets**														
Dump Module	0	0	0	0	0	0	0	0	0	59	117	117		
Phase In (Gains)														
Dump Module	0	0	0	0	0	0	0	0	59	58	0	0		
Final Available Assets														
Dump Module	0	0	0	0	0	0	0	0	59	117	117	117		
Shortfall (Overage)	0	0	0	0	0	0	0	0	58	0	0	0		
Procurement														
Dump Module	0	0	0	0	0	0	0	59	58	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Refrigeration System

180 Day IO 698 60 Day IO 674 Issue Qty 629

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
43 **Initial Available Assets**														
Refrigeration System Unit 350 cu ft (B1645)	0	0	0	0	0	0	172	328	505	674	674	674		
Refrigeration System Rigid Box 350 cu ft (B1710)[1]	0	0	0	0	0	90	150	323	512	600	674	674		
Refrigeration Unit, 100 cu ft (B1650)[2]	209	203	196	193	206	199	192	102	0	0	0	0		
Refrigerator Prefab, 100 cu ft (B1690)[2]	139	120	256	246	236	226	217	166	86	0	0	0		
Refrigeration Unit, 630 cu ft (B1660)[2]	470	427	414	346	320	295	283	133	0	0	0	0		
Refrigerator Prefab, 630 cu ft (B1700)[2]	146	136	126	116	106	96	86	76	0	0	0	0		
Phase Out (Losses)														
Refrigeration System Rigid Box 350 cu ft (B1710)[1]	0	0	0	0	0	0	0	0	20	30	40	50		
Refrigeration Unit, 100 cu ft (B1650)[2]	6	7	6	6	7	7	90	102	0	0	0	0		
Refrigerator Prefab, 100 cu ft (B1690)[2]	19	14	10	10	10	9	51	80	86	0	0	0		
Refrigeration Unit, 630 cu ft (B1660)[2]	43	44	68	26	25	12	150	133	0	0	0	0		
Refrigeration, Prefab, 630 cu ft (B1700)[2]	10	10	10	10	10	10	10	76	0	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
43 (Continued)														
Phase In (Gains)														
Refrigeration System Unit 350 cu ft (B1645)	0	0	0	0	0	172	156	137	169	0	0	0		
Refrigeration System Rigid Box 350 cu ft (B1710)[1]	0	0	0	0	90	60	173	189	88	74	0	0		
Refrigeration Unit, 100 cu ft (B1650)[2]	0	0	3	19	0	0	0	0	0	0	0	0		
Refrigerator, Prefab, 100 cu ft (B1690)[2]	0	150	0	0	0	0	0	0	0	0	0	0		
Refrigeration Unit, 630 cu ft (B1660)[2]	0	31	0	0	0	0	0	0	0	0	0	0		
Refrigerator, Prefab, 630 cu ft (B1700)[2]	0	0	0	0	0	0	0	0	0	0	0	0		
Final Available Assets														
Refrigeration System Unit 350 cu ft (B1645)	0	0	0	0	0	172	328	505	674	674	674	674		
Refrigeration System Rigid Box 350 cu ft (B1710)[1]	0	0	0	0	90	150	323	512	600	674	674	674		
Refrigeration Unit, 100 cu ft (B1650)[2]	203	196	193	206	199	192	102	0	0	0	0	0		
Refrigerator, Prefab, 100 cu ft (B1690)[2]	120	256	246	236	226	217	166	86	0	0	0	0		
Refrigeration Unit 630 cu ft (B1660)[2]	427	414	346	320	295	283	133	0	0	0	0	0		
Refrigerator, Prefab, 630 cu ft (B1700)[2]	136	126	116	106	96	86	76	0	0	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
43 (Continued)														
<u>Shortfall (Overage)</u>														
Refrigeration System Unit (B1645)	44	64	135	152	184	203	(9)	0	0	0	0	0		
Refrigerator System Rigid Box 350 cu ft (B1710)	418	292	312	332	262	221	168	(165)	(139)	(109)	(69)	(19)		
<u>Procurement</u>														
Refrigeration System Unit 350 cu ft (B1645)	0	0	0	0	172	156	177	169	0	0	0	0		
Refrigeration System Rigid Box 350 cu ft (B1710)	0	0	0	90	60	173	104	76	0	0	0	0		

[1] Rigid box only

[2] ..ty shown have been converted to 350 cu ft equivalents

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Mobile Electric Power Distribution System

180 Day IO 62 60 Day IO 51 Issue Qty 36

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
44 Initial Available Assets														
MEPDIS	0	0	0	0	32	51	51	51	51	51	51	51		
Phase Out (Losses)[1]														
Phase In (Gains)														
MEPDIS	0	0	0	32	19	0	0	0	0	0	0	0		
Final Available Assets	0	0	0	32	51	51	51	51	51	51	51	51		
Shortfall (Overage)[1]														
Procurement														
MEPDIS	0	0	32	19	0	0	0	0	0	0	0	0		

[1] N/A—New Item. Supplements general illumination set

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Air-Conditioner[1]

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	OY
45*														
Air Conditioner, TAMCN B0001			180 Day IO 208			60 Day IO 202		Issue Qty 0						
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Conditioner, TAMCN B0002			180 Day IO 283			60 Day IO 270		Issue Qty 0						
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Conditioner, TAMCN B0003			180 Day IO 4,376			60 Day IO 4,173		Issue Qty 3,256						
	0	0	0	0	103	532	490	414	223	288	316	386	0	675
Air Conditioner, TAMCN B0004			180 Day IO 861			60 Day IO 833		Issue Qty 150						
	0	0	0	0	70	160	0	0	0	0	0	0	0	0
Air Conditioner, TAMCN B0005			180 Day IO 2,783			60 Day IO 2,676		Issue Qty 2,122						
	0	0	0	0	60	381	532	248	157	202	223	269	0	481
Air Conditioner, TAMCN B0006			180 Day IO 193			60 Day IO 188		Issue Qty 0						
	0	0	0	0	36	0	0	0	0	0	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	OY
45* (Continued)														
Air Conditioner, TAMCN B0008		180 Day IO 65			60 Day IO 65		Issue Qty 0							
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Conditioner, TAMCN B0009		180 Day IO 108			60 Day IO 104		Issue Qty 0							
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Conditioner, TAMCN B0011		180 Day IO 1,201			60 Day IO 1,141		Issue Qty 801							
	0	0	0	0	69	285	110	72	44	55	66	77	0	141
Skid Assembly B2004		180 Day IO 4,708			60 Day IO 4,441		Issue Qty 3,555							
	0	0	0	0	479	497	625	348	223	288	316	386	0	675
Skid Assembly B2006		180 Day IO 2,937			60 Day IO 2,808		Issue Qty 2,006							
	0	0	0	0	74	441	369	248	157	202	223	269	0	481

* Phase in only

1 Includes quantities for the current capability, as well as MPS, plus those required for FLS.

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Generator[1]

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	OY
46*														
Generator, 3 kw, 60 hz (180 Day IO 2,385; 60 Day IO 2,236; Issue Qty 1,397)	0	0	0	0	400	326	705	304	0	0	0	0	0	0
Generator, 3 kw, 400 hz (180 Day IO 1,347; 60 Day IO 1,269; Issue Qty 701)	0	0	0	0	60	231	217	225	212	0	0	0	0	0
Generator, 10 kw, 60 hz (180 Day IO 885; 60 Day IO 863; Issue Qty 372)	0	0	0	0	70	27	101	93	79	25	32	34	0	57
Generator, 10 kw, 400 hz (180 Day IO 510; 60 Day IO 494; Issue Qty 0)	0	0	0	0	75	0	0	0	0	0	0	0	0	0
Generator, 30 kw, 60 hz (180 Day IO 1,601; 60 Day IO 1,417; Issue Qty 360)	0	0	0	0	116	140	50	29	23	33	33	33	0	62
Generator, 30 kw, 400 hz (180 Day IO 435; 60 Day IO 383; Issue Qty 0)	0	0	0	0	93	0	0	0	0	0	0	0	0	0
Generator, 60 kw, 60 hz (180 Day IO 1,563; 60 Day IO 1,364; Issue Qty 810)	0	0	0	0	75	117	173	135	66	79	86	85	0	155

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	OY
46* (Continued)														
			180 Day IO 645		60 Day IO 568		Issue Qty 0							
Generator, 60 kw, 400 hz	0	0	0	0	105	0	0	0	0	0	0	0	0	0
			180 Day IO 836		60 Day IO 725		Issue Qty 440							
Generator, 100 kw, 60 hz	0	0	0	0	27	52	67	54	41	56	50	59	0	108
			180 Day IO 284		60 Day IO 244		Issue Qty 60							
Generator, 200 kw, 60 hz	0	0	0	0	0	8	6	20	17	4	4	0	0	8
			180 Day IO 300		60 Day IO 271		Issue Qty 0							
Frequency Convertor, 4 kw	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			180 Day IO 540		60 Day IO 467		Issue Qty 175							
Frequency Convertor, 10 kw	0	0	0	0	0	45	142	0	0	0	0	0	0	0
			180 Day IO 241		60 Day IO 220		Issue Qty 166							
Frequency Convertor, 100 kw	0	0	0	0	0	70	50	0	63	0	0	0	0	0
			180 Day IO 204		60 Day IO 185		Issue Qty 65							
Dummy Load, 100 kw	0	0	0	0	96	0	0	0	0	0	0	0	0	0

* Phase in only

1 Includes quantities for the current capability, as well as MPS, plus those required for FLS.

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Bulk Laundry Unit

180 Day IO 206 60 Day IO 191 Issue Qty 173

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
47														
Initial Available Assets														
Bulk Laundry Unit	0	0	0	0	0	0	0	96	191	191	191	191		
Laundry Unit, Trailer-Mounted (B1225)	38	57	47	61	105	141	137	95	0	0	0	0		
Phase Out (Losses)														
Laundry Unit, Trailer-Mounted (B1225)[1]	16	28	1	1	2	4	42	0	0	0	0	0		
Phase In (Gains)														
Bulk Laundry Unit	0	0	0	0	0	0	96	65	0	0	0	0		
Laundry Unit, Trailer-Mounted (B1225)	35	18	15	45	38	0	0	0	0	0	0	0		
Final Available Assets	57	47	61	105	141	137	191	191	191	191	191	191		
Shortfall (Overage)	134	144	130	86	50	54	0	0	0	0	0	0		
Procurement														
Bulk Laundry Unit	0	0	0	0	0	96	95	0	0	0	0	0		

[1] Bulk laundry unit replaces all trailer-mounted laundry units except those allocated to the Division (CLABU supports the Division)

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Bath/Shower Unit

180 Day IO 151   60 Day IO 141   Issue Qty 130[2]

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
48														
Initial Available Assets														
Bath/Shower Unit	0	0	0	0	0	0	0	0	0	0	0	0		
Bath Unit, Trailer-Mounted (B0060)	187	200	227	219	211	203	195	195	187	179	171	163		
Phase Out (Losses)														
Bath Unit, Trailer-Mounted (B0060)	27	19	25	8	8	8	0	8	8	8	8	8		
Phase In (Gains)														
Bath/Shower Unit[1]	0	0	0	0	0	0	0	0	0	0	0	0		
Bath Unit, Trailer-Mounted (B0060)	40	46	17	0	0	0	0	0	0	0	0	0		
Final Available Assets	200	227	219	211	203	195	195	187	179	171	163	155		
Shortfall (Overage)[3]	(59)	(86)	(78)	(70)	(62)	(54)	(54)	(46)	(38)	(30)	(22)	(14)		
Procurement														
Bath/Shower Unit	0	0	0	0	0	0	0	0	0	0	0	0		

1 None purchased until after FY90

2 Based on supporting all MAF elements except the Division (CLABU support the Division)

3 Shortage not significant since TAM B0060 capacity significantly exceeds that of new bath shower unit (24 nozzles to 8)

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Marine Corps Field Feeding System

180 Day IO 135 60 Day IO 135 Issue Qty 135

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
49														
<u>Initial Available Assets</u>														
MFFS	0	0	0	0	0	0	0	0	34	67	100	135		
<u>Phase Out (Losses)</u>[1]														
<u>Phase In (Gains)</u>														
MFFS	0	0	0	0	0	0	0	34	33	33	35	0		
<u>Final Available Assets</u>	0	0	0	0	0	0	0	34	67	100	135	135		
<u>Shortfall (Overage)</u>[1]														
<u>Procurement</u>														
MFFS	0	0	0	0	0	0	34	33	33	35	0	0		

[1] N/A–Replaces existing field messing equipment

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Bakery System

180 Day IO 5 60 Day IO 5 Issue Qty 5

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
50														
<u>Initial Available Assets</u>														
Bakery System	0	0	0	0	0	0	0	0	0	0	3	5		
Bakery Plant, Trlr Mtd., M1945 (C4130)	12	11	10	9	8	7	7	6	5	5	2	0		
<u>Phase Out (Losses)</u>														
Bakery Plant, Trlr Mtd., M1945 (C4130)	1	1	1	1	1	0	1	1	0	3	2	0		
<u>Phase In (Gains)</u>														
Bakery System	0	0	0	0	0	0	0	0	0	3	2	0		
<u>Final Available Assets</u>														
Bakery System	0	0	0	0	0	0	0	0	0	3	5	5		
Bakery Plant, Trlr Mtd., M1945 (C4130)	11	10	9	8	7	7	6	5	5	2	0	0		
<u>Shortfall (Overage)</u>	(6)	(5)	(4)	(3)	(2)	(2)	(1)	0	0	0	0	0		
<u>Procurement</u>														
Bakery System	0	0	0	0	0	0	0	0	3	2	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
51 <u>Phase In (Gains)</u>			180 Day IO 74		60 Day IO 74		Issue Qty 67							
Scraper, Earthmoving, Self-Propelled	0	0	0	0	0	74	0	0	0	0	0	0	0	0
			180 Day IO 300		60 Day IO 282		Issue Qty 269							
52 <u>Phase In (Gains)</u>														
Tractor, Medium, Full Tracked	0	0	0	0	79	203	0	0	0	0	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Lubricating and Servicing Unit

180 Day IO 306   60 Day IO 289   Issue Qty 277

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
53														
Initial Available Assets														
Lubricating and Servicing Unit, Skid, Mtd. (D0190)	0	0	0	0	0	0	74	157	241	289	289	289		
Lubricating and Servicing Unit, Trlr, Mtd. (D0190)	304	278	282	195	122	112	103	23	0	0	0	0		
Total	304	278	282	195	122	112	177	180	241	289	289	289		
Phase Out (Losses)														
Lubricating and Servicing Unit, Trlr, Mtd. (D0190)	26	23	87	73	10	9	80	23	0	0	0	0		
Phase In (Gains)														
Lubricating and Servicing Unit, Skid, Mtd. (D0190)	0	0	0	0	0	74	83	84	48	0	0	0		
Lubricating and Servicing Unit, Trlr, Mtd. (D0190)	0	27(R)	0	0	0	0	0	0	0	0	0	0		
Final Available Assets	0	0	0	0	0	0	0	0	0	0	0	0		
Total	278	282	195	122	112	177	180	241	289	289	289	289		
Shortfall (Overage) (Ref. Full IO)	28	24	111	184	194	129	126	65	17	17	17	17		
Procurement	0	0	0	0	74	83	84	48	0	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Steam Cleaner

180 Day IO 392 60 Day IO 392 Issue Qty 392

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
54														
Initial Available Assets														
Cleaner, Steam Pressure, Skid, Mtd. (D0089)	0	0	0	0	0	0	0	0	0	65	127	226	315	392
Cleaner, Steam Pressure, Commercial	0	0	309	309	370	370	370	370	370	61	61	0	0	0
Cleaner, Steam Pressure Jet, Trlr, Mtd. (D0090)	314	211	110	33	0	0	0	0	0	0	0	0	0	0
Total	314	211	419	342	370	370	370	370	370	126	188	226	315	392
Phase Out (Losses)														
Cleaner, Steam Pressure Jet, Trlr, Mtd. (D0090)	103	101	77	33	0	0	0	0	0	0	0	0	0	0
Cleaner, Steam Pressure, Commercial	0	0	0	0	0	0	0	0	309	0	61	0	0	0
Phase In (Gains)														
Cleaner, Steam Pressure, Skid, Mtd. (D0089)	0	0	0	0	0	0	0	0	65	62	99	89	77	0
Cleaner, Steam Pressure, Commercial	0	309	0	61	0	0	0	0	0	0	0	0	0	0
Final Available Assets	211	419	342	370	370	370	370	370	126	188	226	315	392	0
Shortfall (Overage) (Ref. Full IO)	181	(27)	50	22	22	22	22	22	266	204	166	77	0	0
Procurement														
Cleaner, Steam Pressure, Skid, (D0089)	0	0	0	0	0	0	0	65	62	99	89	77	0	0
Cleaner, Steam Pressure, Commercial	309	0	61	0	0	0	0	0	0	0	0	0	0	0

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Amphibious Assault Fuel System

180 Day IO 51 60 Day IO 51 Issue Qty 48

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
55														
Initial Available Assets														
AAFS (B0685)	41	40	40	40	40	45	49	51	51	51	51	51		
Phase Out (Losses)														
AAFS (B0685)	1	0	0	0	0	0	3	6	0	0	0	0		
Phase In (Gains)														
AAFS (B0685)	0	0	0	0	5	4	5	6	0	0	0	0		
Final Available Assets	40	40	40	40	45	49	51	51	51	51	51	51		
Shortfall (Overage)	11	11	11	11	6	2	0	0	0	0	0	0		
Procurement														
AAFS (B0685)	0	0	0	5	4	5	6	0	0	0	0	0		

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Tactical Airfield Fuel Dispensing System

180 Day IO 84   60 Day IO 84   Issue Qty 80

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
56 **Initial Available Assets**														
TAFDS (B0675)	81	81	81	81	81	84	84	84	84	84	84	84		
Phase Out (Losses)														
TAFDS (B0675)	0	0	0	0	7	8	8	0	0	0	0	0		
Phase In (Gains)														
TAFDS (B0675)	0	0	0	0	10	8	8	0	0	0	0	0		
Final Available Assets	81	81	81	81	84	84	84	84	84	84	84	84		
Shortfall (Overage)	3	3	3	3	0	0	0	0	0	0	0	0		
Procurement														
TAFDS (B0675)	0	0	0	10	8	3	0	0	0	0	0	0		

[1] System in being. No replacement or procurement planned other than product improvement of and/or replacement of individual components

Table 3-2. Phase-In/Phase-Out Schedules (Continued)

Helicopter Expedient Refueling System

180 Day IO 76 60 Day IO 76 Issue Qty 72

	FY 79	FY 80	FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
57 <u>Initial Available Assets</u>														
HERS (B1135)	67	67	67	67	67	67	76	76	76	76	76	76		
<u>Phase Out (Losses)</u>														
HERS (B1135)	0	0	0	0	0	1	0	0	0	0	0	0		
<u>Phase In (Gains)</u>														
HERS (B1135)	0	0	0	0	0	10	0	0	0	0	0	0		
<u>Final Available Assets</u>	67	67	67	67	67	76	76	76	76	76	76	76		
<u>Shortfall (Overage)</u>	9	9	9	9	9	0	0	0	0	0	0	0		
<u>Procurement</u>														
HERS (B1135)	0	0	0	0	10	0	0	0	0	0	0	0		

CHAPTER 4

MANAGEMENT

4.1 INTRODUCTION

This chapter addresses the management procedures being followed in implementation of the FLS. Included are discussions relating to organization, assessment, scheduling, and progress reporting. Other features of this chapter address management centralization versus decentralization, in-house or contractor-supported management services, interfaces, and work flow procedures.

The FLS management responsibilities are derived from the program initiation document that was approved by the Commandant of the Marine Corps on 30 January 1978. That document provided:

a. Formal program initiation for development and acquisition of FLS elements.

b. Establishment of the FLS Office to coordinate the acquisition of the FLS.

c. Integration of the subsystems into the FLS for management and analysis.

In response to this direction, an organizational document was approved in concept, and personnel from within the Materiel Division (Code LM) were assigned to the "FLS Office."

Subsequently, this office was redesignated as the "Concepts and Requirements Office" (C&RO) by Director of Materiel Division Memorandum, dated 8 November 1978. The mission for the C&RO is as follows:

> "To assist the Deputy Chief of Staff for Installations and Logistics in executing Acquisition Program Sponsor (APS) responsibilities required for system acquisitions. Coordinate formulation and execution of the RDT&E program budget matters . . . ."

To accomplish the foregoing mission, the billet descriptions and rank structure listed in table 4-1 were established.

Table 4–1. USMC Table of Organization (T/O)

Billet Description	Rank	MOS/ Series	Na/Civ	Ag/Off	En
Concepts and Requirements Office					
Head	Col.	9908		1	
Asst. Head	GS–14	2003	1		
Operations/Assessment Off.	Lt.Col.	9910		1	
POM/Budget Off.	Major	9910		1	
Budget Analyst	GS–9	0506	1		
Service Support ASPO*	Lt. Col.	0402		1	
Engineer Equipment ASPO	Lt. Col.	1302		1	
Motor Transport ASPO	Major	3502		1	
Shelters/Containers ASPO	GS–13	0301	1		
Clerical Asst. (Typing)	GS–5	0301	1		
Clerical Asst. (Typing)	GS–5	0301	1		
Total			0/5	0/6	0

* Acquisition Sponsor Project Officer

The mission statement for the C&RO implied the acquisition sponsorship for all hardware under cognizance of the Installations and Logistics (I&L) Department. However, the T/O in table 4–1 provided billets for the execution of acquisition sponsorship responsibilities for FLS items only. ASPOs were not provided for other I&L Department acquisition programs such as Test and Calibration Equipment, and General Supply. A subsequent realignment of the C&RO was developed to accommodate general supply items and is currently being implemented (table 4–2).

Table 4–2. T/O for the Concepts and Requirements Office

Line	Billet Description	Rank	MOS
5103	Concepts and Requirements Office		Code LM–2
140	Head	Col.	9906
141	Asst. Head	GS–14	2003
142	Service Support ASPO	Lt. Col.	0402

Table 4–2. T/O for the Concepts and Requirements Office—Continued

Line	Billet Description	Rank	MOS
143	POM/Budget Off.	Major	9910
144	Budget Analyst	GS–09	0560
145	Operations/Assessment Off.	Lt. Col.	9910
146	Engineer Equipment ASPO	Lt. Col.	1302
147	Motor Transport ASPO	Major	3502
148	Shelter/Container/ General Supply ASPO	GS–13	0301
149	Clerical Asst. (Typing)	GS–05	0301
150	Clerical Asst. (Typing)	GS–05	0301

Basically, the realignment fits a modified mission statement that now reads:

> "To assist the Director, Materiel Division and DC/S for I&L, in executing assigned Acquisition Program Sponsor (APS) responsibilities required for system acquisitions and in coordinating formulation and execution of RDT&E program budget matters."

This revision further identifies the C&RO areas of responsibility as those encompassing all equipment associated with the FLS and all other DC/S for I&L responsible tactical equipment with the following exceptions:

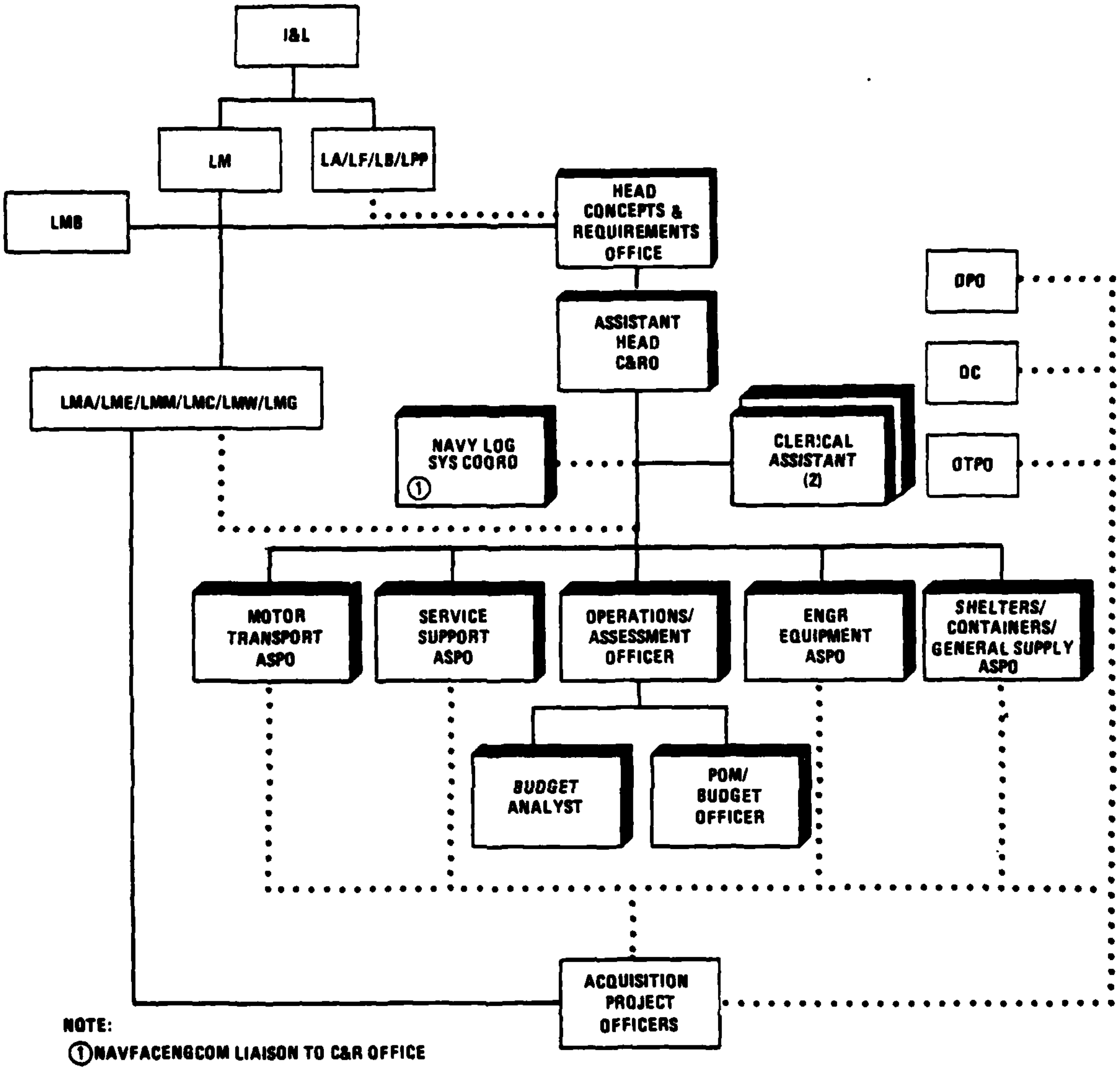
- Test, measurement, diagnostic, radiac, and calibration equipment
- Nonrotating power source equipment
- Clothing

As a result, the general supply (less clothing) commodity area has been added to the Shelter and Container ASPO responsibilities as shown in figure 4–1. A detailed discussion of the organization is included in paragraph 4.1.4.

4.1.1 General

The management process for the FLS is viewed as cyclical in nature and is depicted graphically in figure 4–2.

Iterations of the process are caused by changes precipitated in the system as a result of program reviews, budget constraints, equipment modifications, procurement leadtime changes, new or expanded objectives, and other variables common to system acquisitions.



NOTE:
① NAVFACENGCOM LIAISON TO C&R OFFICE

LEGEND

—— CHAIN OF COMMAND

• • • • LIAISON

▭ C&R OFFICE (LM-2)

ASPO – ACQUISITION SPONSOR PROJECT OFFICER
DPO – DEVELOPMENT PROJECT OFFICER
DC – DEVELOPMENT COORDINATOR
OTPO – OPERATIONAL TEST PROJECT OFFICER

Figure 4–1. Concepts and Requirements Office (LM–2) Organization

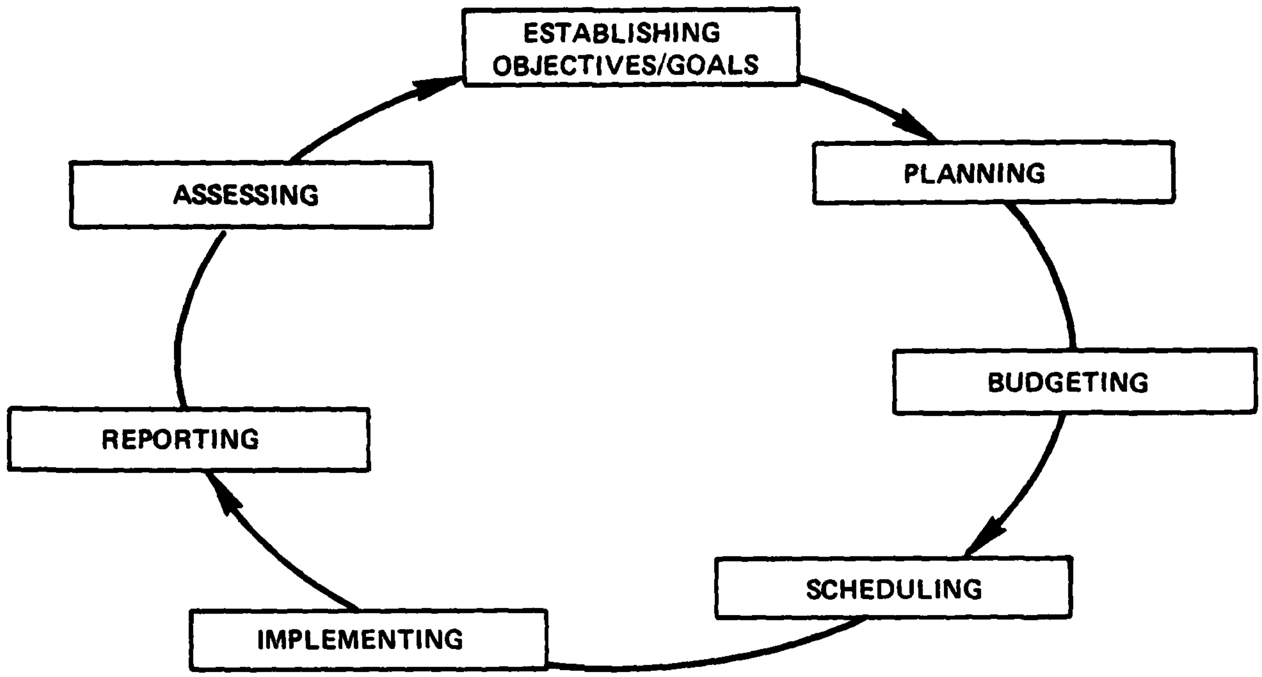


Figure 4-2. FLS Management Process

4.1.2 Objective Analysis

Objective support of management decisions is provided by the analysis of quantitative data such as costs, quantities, efficiency, and throughput. The FLS, comprising discrete hardware elements of definable size, weight, cost, and capabilities, lends itself to this approach. The accuracy of the data and information used directly affects the validity of such decisions. In the FLS acquisition, a continuous process of data refinement and program information will impact on previously made management decisions. Accordingly, a continuous review of management decisions is a part of this process.

4.1.3 Program Management

Proper management of the various C&RO acquisition efforts dictates the use of an information system sensitive to the early detection of deviations in the FLS acquisition which exceed established boundaries (limits) or milestones (time constraints). This system applies to the early accomplishment of milestones as well as to delays encountered. Schedules, budgets, and plans must be re-examined and quite possibly adjusted to accommodate fact-of-life changes when deviations to planned performance are detected. Realistic scheduling and reporting of progress are firm requisites to information system viability. Further, the rapidity in which changes are detected can be crucial to successful reprogramming actions. To provide for adequate program visibility and to evaluate interface impacts,

structuring and periodic analysis of the program effort by means of a control network are required. It should be noted that all the elements now comprising the FLS, as well as others that could be added, are individually judged upon their own qualities with regard to their continued development and acquisition. However, their interoperability as reflected in the plan must also be recognized. In this regard, a work breakdown structure is maintained to accurately depict all program associations and provide a logical structure for cost accounting. A work breakdown structure and the scheduled in-service dependency network are provided in paragraphs 4.2.3 and 4.3.2 respectively.

4.1.4 Organization

The functions assigned to the implementation organization supplement the systems acquisition management process as stated in MCO P5000.10 and are categorized into specific activities such as planning, engineering, budgeting, and assessment. The C&RO organizational structure depicted in figure 4-1 has taken the above factors into account and is designed to reflect the revised mission and functions of Code LM-2. C&RO responsibilities, as defined by the latest revised mission statement, and as stated in paragraph 4.1, exclude the billet of a Calibration and Test Equipment ASPO while including a general supply (less clothing) functional responsibility for the Shelter and Container ASPO. "Other Procurements" are monitored and reviewed by the Operations and Assessment Officer.

Figure 4-3 is an activity flow chart showing the major functions outlined by the Systems Acquisition Management Manual, MCO P5000.10, and their manner of accommodation within the C&RO. This chart also provides an overview of the work flow within the C&RO.

4.1.5 Peripheral Considerations

FLS program objectives necessarily focus on the use of designated hardware with trained personnel in logistic support of the MAGTF in an amphibious objective area (AOA). However, the efficient transport of these resources to the AOA is also of concern. Such transport is a Navy responsibility. Yet its effective accomplishment is an obvious prerequisite to the subsequent employment of the FLS. In this regard, the 1979 NAVSEA report concerning the technical feasibility of modular suiting of containerships is of significant interest to the FLS and to Marine Corps planners.

Modular suiting includes the adoption of standard-sized (8'X8'X20') container support modules to accommodate and sustain troops aboard containerships during AFOE transits. It was deemed to be a feasible concept as reported by NAVSEA. The basic study upon which NAVSEA judgments were made recommended that a follow-on phase be initiated that would involve the testing of prototype hardware initially assembled and evaluated ashore.

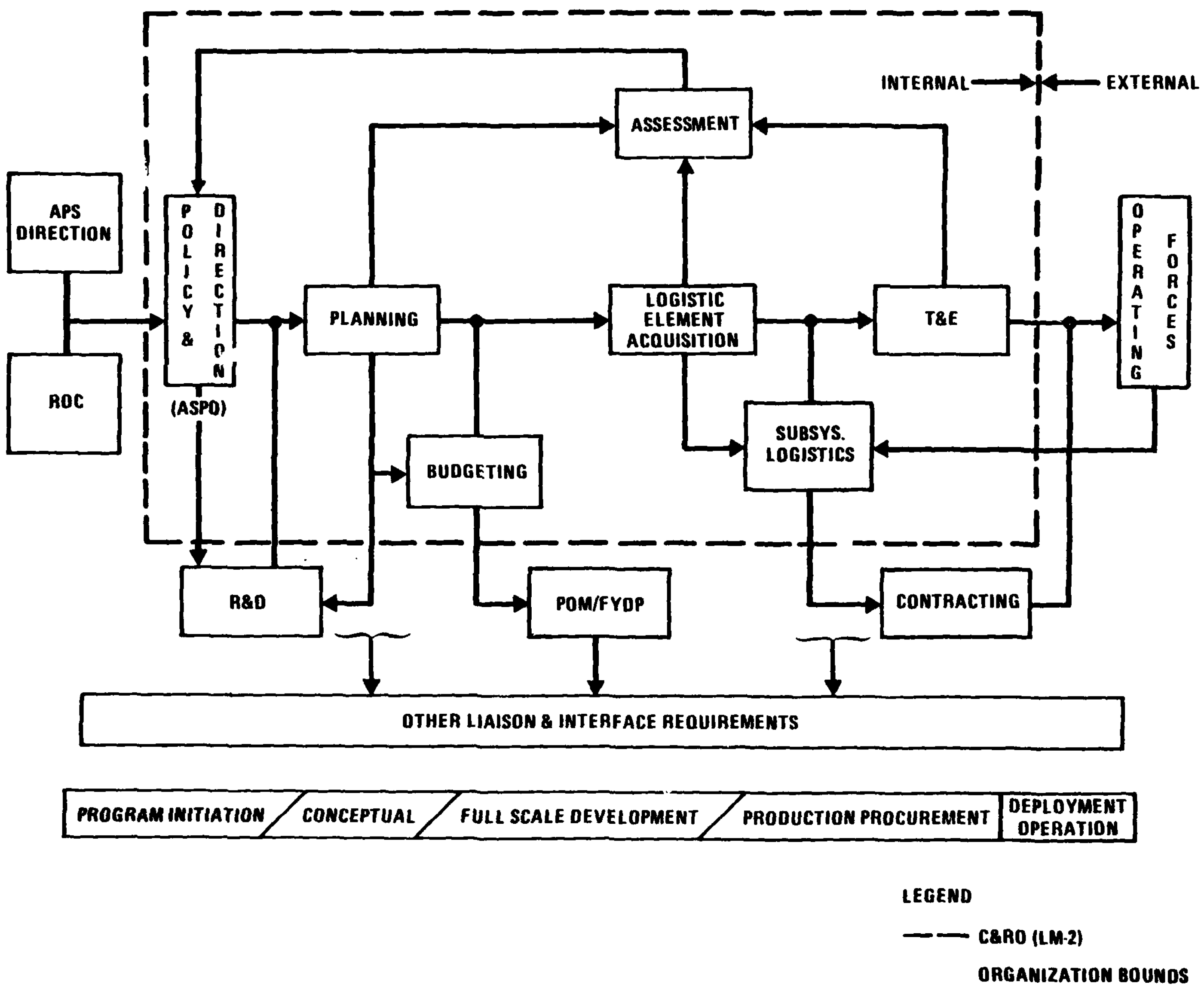


Figure 4-3. Activity Flow Chart

The hardware would then be loaded aboard a containership for actual testing at sea. The results of the study and their recommendations were forwarded to the Secretary of the Navy for transmittal to Congress.

Additionally, the Maritime Administration's project "Sea Shed" has bearing upon FLS. The objective of this project is to maximize the usefulness of non-self-sustaining containerships in the movement of outsized military cargo in support of a rapid deployment. Here, Sea Shed's complementary relationship to modular suiting and its effect on the Marine Corps' capability to deploy its forces are of significance and are being monitored.

Also, vital complementary links such as NAVFAC's Amphibious Logistics System (ALS), Container Offloading and Transfer System (COTS), and Temporary Container Discharge Facility (TCDF) development further affect FLS. Here, a continuing dialogue, both formal and informal, between the staffs of these projects is the key to an integrated progression of the individual RDT&E events leading to a new threshold of capability for the Marine Corps.

4.2 MANAGEMENT SYSTEM

4.2.1 System Components

The management system to be employed in the implementation of FLS provides for accomplishment of five basic functions. These are:

- Planning (establishing program approaches, responsibilities, and thresholds)
- Financial resources management
- Program execution
- Program assessment
- Program modification

Established program thresholds (cost, technical, and schedule), financial resource management procedures, and program assessment provisions form the major control elements. Program execution is the actual implementation of the approved plans, including requisite provisions for configuration control, logistics support, and test and evaluation, that culminates in the introduction of hardware into operational use. Program modification involves necessary adjustments to plans and financial resources based upon the actual program execution experience versus that which was planned. Figure 4–4 is a graphic depiction of the interdependency of these management functions.

4.2.2 Program Implementation

The primary means of disseminating program guidance and providing for coordination is through positive implementation of the various plans and documents comprising the FLS program planning baseline. Major components of the planning baseline are described in

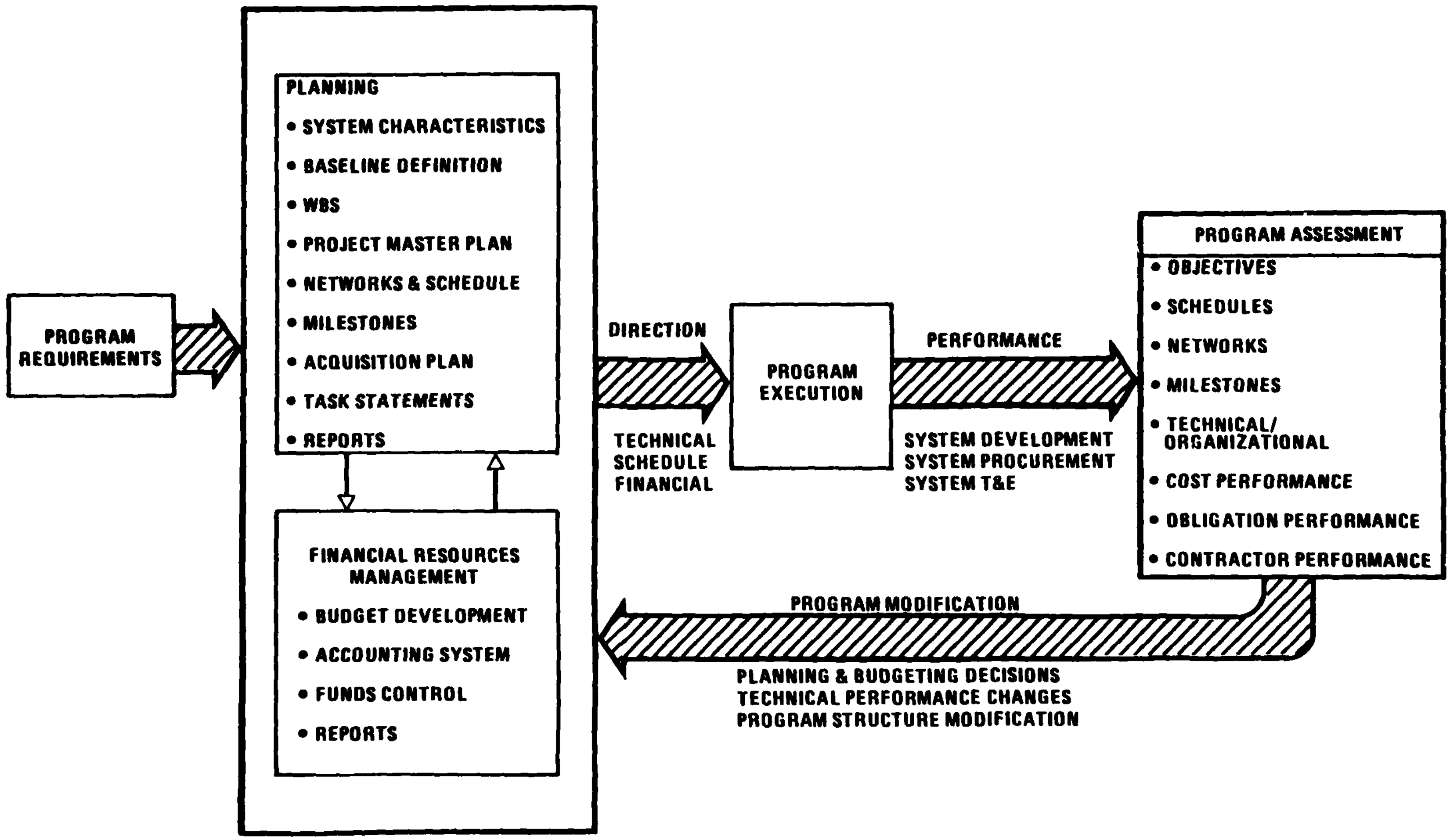


Figure 4-4. Management Network

paragraph 4.2.3. These plans are supported by requisite financial resources. Financial management and program review concepts and procedures are employed to provide a continuing evaluation of program status versus that anticipated by the planning baseline with respect to hardware, software, and system support.

4.2.3 Planning

Key elements of the FLS planning baseline include the work breakdown structure, program objectives, performance standards, major milestones and program schedules, responsibilities matrix, and financial resources management.

Work Breakdown Structure (WBS). The WBS is a major tool in the management process. It is used for management budgeting, cost collection and accounting, assignment of responsibilities, scheduling, and progress reporting. The WBS, as shown in figure 4-5, illustrates the five levels of hardware comprising FLS and the corresponding levels of management and control.

The WBS is designed to give proper visibility to the total system acquisition process. For this reason, primary hardware development efforts have been segregated from those elements which support the hardware, i.e., system engineering and integration, system test and evaluation, and project management. However, the role of each of the development activities with regard to system support is fully recognized.

Milestones and Program Schedules. Major program schedules are described in section 4.3 and are presented in appendix C.

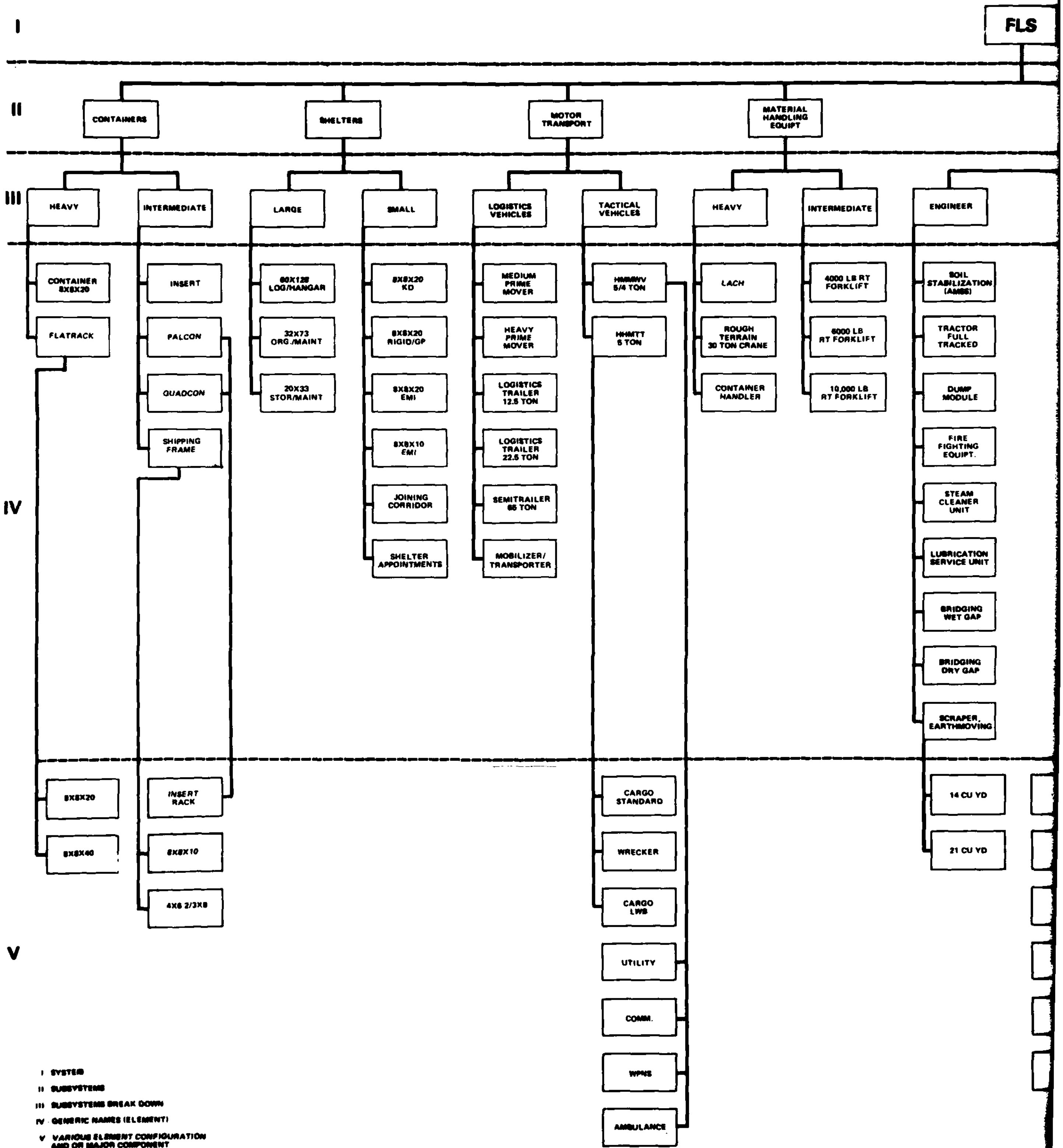
Responsibilities Matrix. The FLS Responsibility Matrix, figure 4-6, identifies key management-related documents for each FLS element and notes those activities/personnel responsible for their development.

4.2.4 Financial Resources Management

Financial resources management refers to the formulation, execution, and control of financial resources required to accomplish FLS program objectives within the framework of the Marine Corps' planning, programming, and budgeting system. In this process, funding requirements are translated into a budget plan that, upon approval by management at various levels of responsibility, expresses program tasks in terms of dollar value and establishes financial standards by which performance can be compared and evaluated.

The Head, C&RO, ensures that a total FLS program/budget is developed, maintained, and properly justified. He provides information reflecting these responsibilities to support the Marine Corps input to the planning, programming, and budgeting process. The budget formulation and execution process are discussed below.

As the Acquisition Sponsor, the Deputy Chief of Staff for Installations and Logistics enters the resources approved for procurement of FLS items into the 5-Year Defense Plan (FYDP) during the normal Program Objective Memorandum (POM) cycle. The FYDP,



FLS
I
II
III
IV
V
CONTAINERS
SHELTERS
MOTOR TRANSPORT
MATERIAL HANDLING EQUIPT
HEAVY
INTERMEDIATE
LARGE
SMALL
LOGISTICS VEHICLES
TACTICAL VEHICLES
HEAVY
INTERMEDIATE
ENGINEER
CONTAINER 8X8X20
FLATRACK
INSERT
PALCON
QUADCON
SHIPPING FRAME
60X128 LOG/HANGAR
32X73 ORG./MAINT
20X33 STOR/MAINT
8X8X20 KD
8X8X20 RIGID/GP
8X8X20 EMI
8X8X10 EMI
JOINING CORRIDOR
SHELTER APPOINTMENTS
MEDIUM PRIME MOVER
HEAVY PRIME MOVER
LOGISTICS TRAILER 12.5 TON
LOGISTICS TRAILER 22.5 TON
SEMITRAILER 65 TON
MOBILIZER/ TRANSPORTER
HMMWV 5/4 TON
HMMTT 5 TON
LACH
ROUGH TERRAIN 30 TON CRANE
CONTAINER HANDLER
4000 LB RT FORKLIFT
6000 LB RT FORKLIFT
10,000 LB RT FORKLIFT
SOIL STABILIZATION (AMSS)
TRACTOR FULL TRACKED
DUMP MODULE
FIRE FIGHTING EQUIPT.
STEAM CLEANER UNIT
LUBRICATION SERVICE UNIT
BRIDGING WET GAP
BRIDGING DRY GAP
SCRAPER, EARTHMOVING
8X8X20
8X8X40
INSERT RACK
8X8X10
4X6 2/3X8
CARGO STANDARD
WRECKER
CARGO LWB
UTILITY
COMM.
WPNS
AMBULANCE
14 CU YD
21 CU YD
I SYSTEM
II SUBSYSTEMS
III SUBSYSTEMS BREAK DOWN
IV GENERIC NAMES (ELEMENT)
V VARIOUS ELEMENT CONFIGURATION AND OR MAJOR COMPONENT

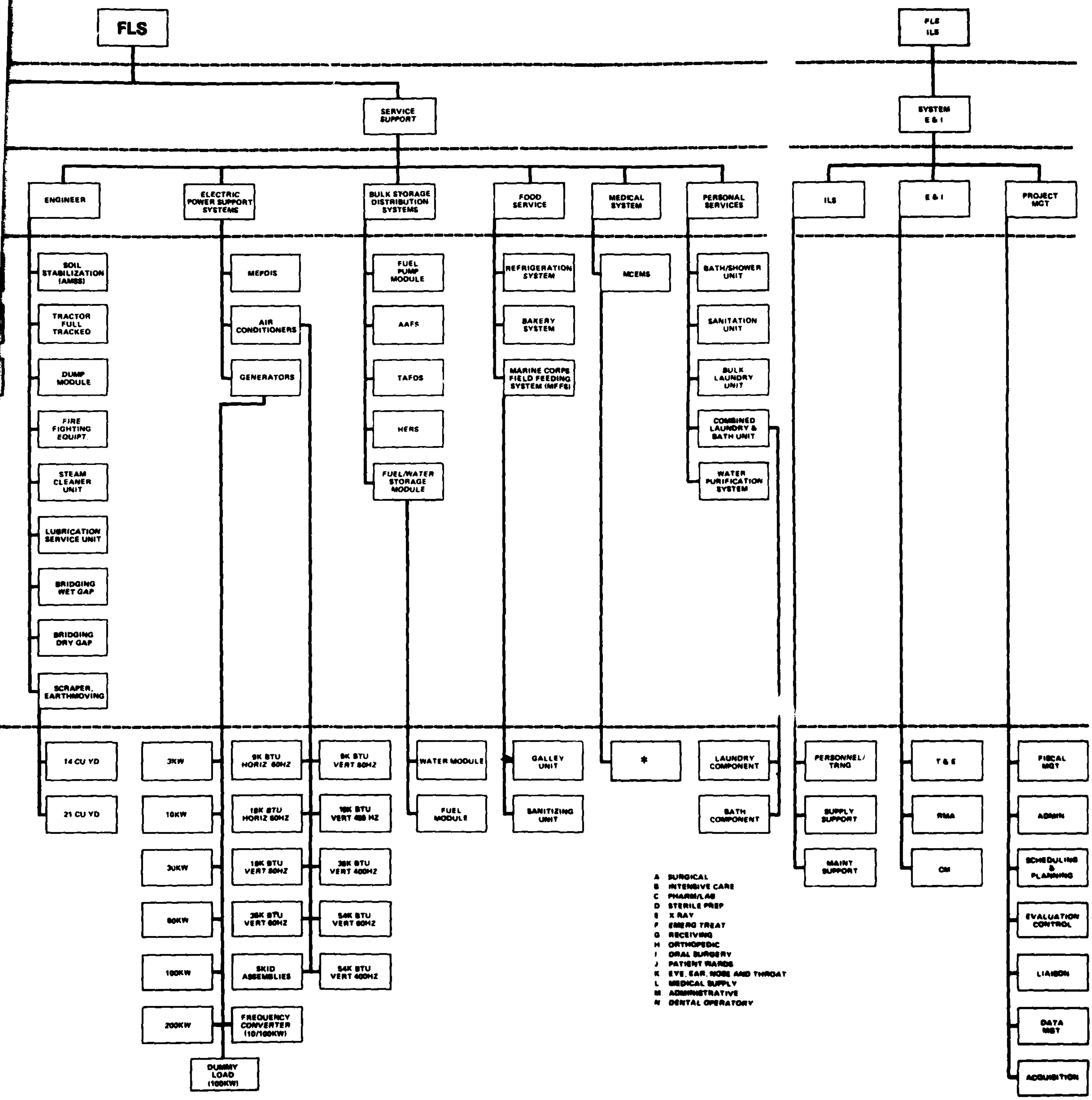


Figure 4–5. Work Breakdown Structure

FLS SUBSYSTEM	ELEMENT DESCRIPTION	ROC	PDA	DEVP	PROCP	ALO	ILSP	LAP		TEMP
								PT I	PT II	
	INSERT	MCDEC	NAVFAC	NAVFAC	APO	APO	APO	APO	APO	MCOTEA/
	PALCON									MCDEC
	QUADCON									
CONTAINER	CONTAINER 8x8x20		NA							
	FLATRACK 8x8x20		NA							
	FLATRACK 8x8x40		NA							
	SHIPPING FRAME 8x8x10		MCDEC							
	SHIPPING FRAME 4x6-2/3x8		MCDEC							
	SHELTER 60x128	MCDEC	NA	NAVFAC	APO	APO	APO	APO	APO	MCOTEA/
	SHELTER 32x73		NA							MCDEC
	SHELTER 20x33		NA							
	SHELTER 8x8x20 KNOCKDOWN		NAVFAC							
SHELTER	SHELTER 8x8x20 RIGID/GP									
	SHELTER 8x8x20 EMI									
	SHELTER 8x8x10 EMI									
	SHELTER JOINING CORRIDOR 7x7x11									
	SHELTER APPOINTMENTS									
	HIGH-MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV)	MCDEC	TACOM	MCDEC	APO	APO	APO	APO	APO	MCOTEA/
	HEAVY HIGH MOBILITY TACTICAL TRUCK (HHMTT)			TACOM						MCDEC
	MEDIUM PRIME MOVER		MCDEC							
	HEAVY PRIME MOVER									
MOTOR TRANSPORT	LOGISTICS TRAILER (12.5 TON)									
	LOGISTICS TRAILER (22.5 TON)									
	SEMITRAILER (65 TON)		TACOM							
	MOBILIZER/TRANSPORTER		MCDEC							
	ROUGH TERRAIN FORKLIFT (4,000 LB)	MCDEC	MCDEC	MCDEC	APO	APO	APO	APO	APO	NA
	ROUGH TERRAIN FORKLIFT (6,000 LB)									
MATERIAL HANDLING EQUIPMENT	ROUGH TERRAIN FORKLIFT (10,000 LB)									
	ROUGH TERRAIN CRANE (30 TON)		NA							
	CONTAINER HANDLER		MCDEC							
	LIGHTWEIGHT AMPHIBIOUS CONTAINER HANDLER (LACH)		NA	MCDEC MCDEC						
	BRIDGING, DRY GAP	USA	USA	USA	APO	APO	APO	APO	APO	NA
	BRIDGING, WET GAP	MCDEC	NAVFAC	MCDEC	APO	APO	APO	APO	APO	
	MARINE CORPS ENVIRONMENT-CONTROLLED MEDICAL SYSTEM (MCEMS)									
	FUEL/WATER STORAGE MODULE									
	FUEL PUMP MODULE									
	WATER PURIFICATION SYSTEM									
	SOIL STABILIZATION MODULE (AMSS)									
	FIREFIGHTING EQUIPMENT									
	SANITATION UNIT									
	COMBINED LAUNDRY AND BATH UNIT									
	PUMP MODULE		MCDEC							
	REFRIGERATION SYSTEM		NARADCOM							
	MOBILE ELECTRIC POWER DISTRIBUTION SYSTEM (MEPDIS)		NAVFAC							
SERVICE SUPPORT	AIR CONDITIONERS									
	ELECTRIC GENERATORS									
	BULK LAUNDRY UNIT		NARADCOM	NARADCOM						
	BATH/SHOWER UNIT		NAVFAC	MCDEC						
	MARINE CORPS FIELD FEEDING SYSTEM (MFFS)		NARADCOM	NARADCOM						
	BAKERY SYSTEM		NARADCOM	NARADCOM						
	SCRAPER, EARTHMOVING		MCDEC	MCDEC						
	TRACTOR FULL-TRACKED									
	LUBRICATION SERVICE UNIT									
	STEAM CLEANER UNIT									
	AMPHIBIOUS ASSAULT FUEL SYSTEM (AAFS)		NAVFAC							
	TACTICAL AIRFIELD FUEL DISPENSING SYSTEM (TAFDS)									
	HELICOPTER EXPEDIENT REFUELING SYSTEM (HERS)									

ABBREVIATIONS

ALO	ADVANCED LOGISTICS ORDER
APO	ACQUISITION PROJECT OFFICER
DEVP	DEVELOPMENT PLAN
DPO	DEVELOPMENT PROJECT OFFICER
ILSP	INTEGRATED LOGISTICS SUPPORT PLAN
LAP	LETTER OF ADOPTION AND PROCUREMENT
MCDEC	MARINE CORPS DEVELOPMENT AND EDUCATION COMMAND
MCOTEA	MARINE CORPS OPERATIONAL TEST & EVALUATION ACTIVITY
NARADCOM	NATICK RESEARCH AND DEVELOPMENT COMMAND
NAVFAC	NAVAL FACILITIES ENGINEERING COMMAND
PDA	PRINCIPAL DEVELOPMENT AGENCY
PROCP	PROCUREMENT PLAN
TACOM	TANK AUTOMOTIVE COMMAND
TEMP	TEST AND EVALUATION MASTER PLAN
USA	UNITED STATES ARMY

Figure 4–6. Responsibility Matrix

therefore, represents the latest OSD-approved program for the acquisition of FLS items and, as such, reflects the tentative ceiling under which the budget must operate.

Within Code LM, the Materiel Acquisition Support Branch (Code LMA) serves as the focal point for the coordination of all matters pertaining to the POM, FYDP, and material requirements. During formulation and execution of the budget, all funds designated for the program, specifically those which support all FLS research, development, design, and procurement, shall be assigned by the administering office in accordance with the overall FLS financial program. Changes in the financial program require approval of the Head, C&RO, except as directed by the Director, Materiel Division. The Head, C&RO, is responsible for coordinating the preparation of programming and budget estimates and support data as required. The appropriate branches of the Materiel Division include their respective portions of the approved program, as defined by the Head, C&RO, in the integrated financial program submission to Code LMA.

Consequently, program budget revisions will only be accommodated in a manner which precludes pie :emeal deletion of items that may unduly impact on FMF logistics capabilities or operational dependencies. Justification of the program to higher authority shall be the responsibility of the Head, C&RO. In this capacity, he will recommend the assignment and the reprogramming of funds, as necessary, to support the planned development and procurement of the FLS and shall have responsibility for recommending the funding designated in the Marine Corps budget for the FLS program.

The Operations and Assessment Officer acts as the overall coordinator of the FLS budget process. He keeps management aware of performance by monitoring the overall financial and development status of the FLS program and providing recommendations to the Head, C&RO, pertaining to the allocation and control of funds. Control, in this sense, consists essentially of administrating and monitoring FLS projects and accounting for funds. The Head, C&RO, exercises control of funds primarily through review and approval of budget/apportionment submissions and by periodic review of financial status reports. Further, he establishes the dollar thresholds within the RDT&E areas and directs the obligation of RDT&E funds provided to the I&L Division for the FLS. All FLS project work directives (PWDs) will specify that funding data will be provided in the appropriate RDT&E Obligation Phasing Plan (RDOPP). In the event that residual funding from the PWDs becomes available, or that an unforeseen contingency arises, the Head, C&RO, will recommend such reprogramming, as necessary, to satisfy the contingency requirement.

4.2.5 Program Execution

The primary thrust of the FLS program and its execution must emanate through the individual and collective efforts of ASPOs. Their span of control over the acquisition phase

of each element, ranging from the conceptual through the production phase, is tempered by the required adherence to formalized plans as dictated by a myriad of reasons. In order to closely monitor specifications, configuration management, and data management ASPOs must continuously interface with one another as well as with APO and DPO p onnel, laboratories, contractors, and industry.

The Operations and Assessment Officer coordinates ASPO functions and is the focal point in maintaining a total system overview. This overview perspective is further amplified in the duties of the Assistant Head, C&RO, where recommendations and decisions affecting interface relationships are evaluated and can be solidified into program execution, thereby eliminating potential parochial interests that might otherwise adversely affect FLS objectives and goals. Whereas this operational method is suitably designed for the FLS as a major subset of the total C&RO objective, it is also applicable to the direction and execution of other I&L responsibilities vested in C&RO.

The program execution role of the ASPO is further delineated through his scrutiny of proposed efforts and funding which must be translated into required program documentation for acquisition milestone decisions. The documentation is designed to support successful execution of a planned program and to afford higher authority requisite insight to the program acquisition status. Milestone achievements under the plans thereafter become key indications of progress or obstacles in program/element execution. The compc ite picture of document achievement is a positive indication of a viable acquisition program.

4.2.6 Program Assessment

Project Control. Program assessment is the primary method used to ensure continuous maintenance of project control. It is the means by which the Head, C&RO, is ensured a full awareness of all problems actually or potentially jeopardizing the orderly achievement of program objectives, or which may otherwise affect the program during its life cycle. Figure 4–7 depicts the project assessment reporting criteria necessary for maintaining management control. It also depicts the continuous system evaluation cycle applicable in the design, development, testing, and production of a complex system such as FLS.

It is the function of program assessment to constantly provide the program manager with a complete, accurate, and up-to-date evaluation of the total system status including:

- Identification of problems which have occurred or appear likely to occur and are expected to adversely impact the project objectives unless corrective action is taken.
- Determination of the cause of such problems.
- Identification of actual or anticipated impact, insofar as ability to meet project objectives (key milestone dates, technical/operational performance, or cost parameters).

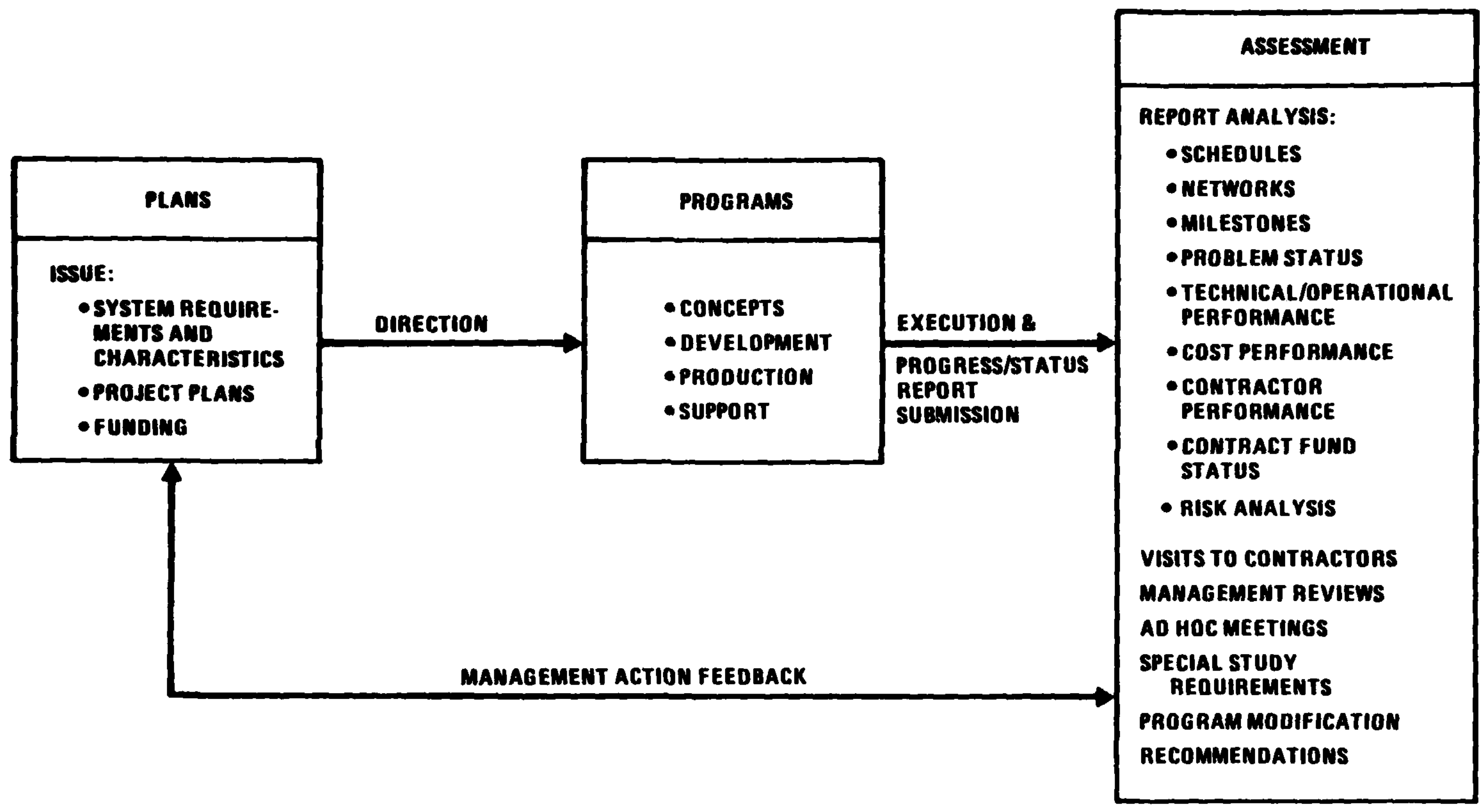


Figure 4–7. C&RO Program Assessment System

- Development of corrective actions considered necessary to avoid or alleviate impact, including trade-off analyses.

To this end it is necessary to:

- Specify and coordinate the acquisition of program information from supporting activities and contractors relative to the status of approved performance plans and to the achievement of established program goals.
- Format status data from supporting activities/contractors and prepare shortfall summary reports for internal use.
- Determine problem causes, define appropriate corrective action(s), and, where possible, conduct cost-effectiveness trade-offs of alternative courses of action.
- Prepare problem analysis reports for each milestone shortfall, summarizing the above analysis.
- Coordinate assessment effort.
- Prepare formal evaluation reports.
- Conduct special evaluation studies and provide reports of such studies as may be required.

Program Assessment Operation. Program assessment relies on a flow of pertinent information to the Head, C&RO. Information flow includes evaluations of the status of development, formal and informal reporting by field activities and prime contractors, and thorough onsite inspection and progress reviews at performing government activities and/or contractor plants.

Within the C&RO, assessment is conducted in two modes:

- Assessment of specific components of the effort regarding their ability to meet operational requirements within the prescribed time frame and funds available.
- Total system evaluation conducted by constant surveillance of the entire project through analysis of reports submitted by acquisition managers, field offices, and contractors, and through regular management reviews and periodic visits to contractor plants, government activities, and test sites.

In the first instance, assessment periodicity is as circumstances dictate or as the Head, C&RO desires. In the latter instance, assessment is conducted on a continuous basis and entails the review of pertinent data to a specified level of the WBS.

Risk Analysis Concept and Execution. The acquisition of a new piece of hardware and its introduction into service use carries with it an inherent risk that it may never reach the service use stage or, if it does, that it may fail to perform in its operational setting. Depending upon the degree of advanced technology involved, this risk factor can be substantial initially; however, as the hardware proceeds along its developmental path, the risk of failure is lessened. Similarly, a system composed of several subsystems, each, in turn

composed of many hardware items or elements, will progress along varied but interrelated paths to reach the goal of system implementation and field operation. Again, there is risk of failure along the route, but normally the failure of one element will not make the system unusable. However, the potential for catastrophic failure should not be discounted in the system acquisition process, since both the operational and monetary implications can be severe if failure does occur. Therefore, specific management attention is required in any system acquisition of the size and complexity of FLS and has been provided through the C&RO to reduce the probability of failure or risk. For management to be fully effective, however, it must have an objective means for estimating the progress of the system. This can be accomplished by performing a risk analysis of the system's hardware aspects. The end product of the risk analysis procedure is a quantification of the probability of not reaching the system's goals. To put this analysis in positive terms, however, probability of success (POS), the complement of risk, is used.

In order to assess the technological POS involved in implementation of the FLS, a model was constructed, figure 4-8. This model requires that a quantitative value be assigned to the developmental phase associated with each element. This is accomplished by assigning each phase with an index number.

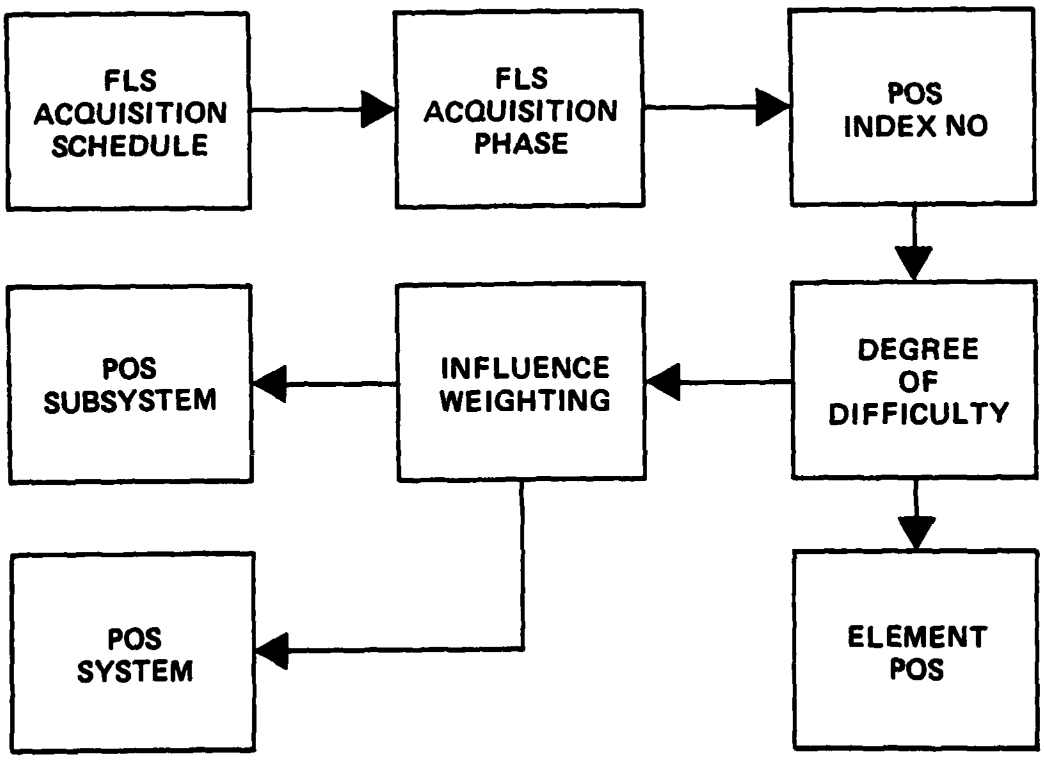


Figure 4-8. Probability of Success (POS) Determination Model

The index numbers are a direct reflection of the status of development only. Also, some consideration had to be given to the degree of difficulty in achieving the development of a given item. For example, development of the PALCON should not be as difficult as that of the combined laundry and bath unit (CLABU). This recognition was accomplished by adjusting the index number to equate to the POS of the particular element.

However, in combining these elements into subsystems and into the total system (FLS), this procedure, as described thus far, does not take into account the importance of a given element to its parent subsystem or to the total system. For example, if the bath/shower unit fails to achieve its established performance goals, the overall system performance would be little affected, but if the LACH were found to be deficient, the effect would be of major importance. In order to provide for this consideration, a weighting system was used to indicate the influence that a given element has on the total FLS effectiveness. A sample format for making these calculations is shown in figure 4–9. The results of calculations for the current POS are indicated in figure 4–10.

In addition to being presented in a statistical form, the POS of both the system and its subsystems can be displayed graphically. As noted earlier, the POS is not static. Consequently, in conjunction with the FLS implementation schedule, a time-phased projection for the anticipated POS can be developed. This can be displayed in company with the actual status as realized in the acquisition. Figure 4–11 portrays how this is done for the system. The shaded pathway, which extends diagonally across the graph, represents the computed POS for the system plus 4 percent on either side of the plot. This pathway is based on the system as defined in April 1978 (42 elements). The dotted line depicts another pathway centerline based on 56 elements that were identified in 1979. The broken line represents the pathway centerline based upon the 57 elements comprising the FLS in June 1980. These pathways illustrate historical and current predicted milestones based upon projections in 1978, 1979, and 1980. The solid line represents the actual accomplishment of those milestones. As can be seen, the actual path is considerably below its projection, as forecasted in 1978, but is relatively close to the more recent projections. It should further be noted that the drops in the actual POS line relate primarily to the expansion of the FLS beyond the 42 original line elements. Many of the new additions were in the earliest stages of development thus lowering the overall POS.

Table 4–3 represents the POS analysis data developed by system and subsystem since April 1978 which is the basis for the depiction contained in figure 4–11.

Program Modification. Based on the results of the assessment function, an evaluation of program problems is made. From this evaluation, necessary modifications to the program are determined and implemented. These modifications might include, but are not limited

SAMPLE RISK ANALYSIS CALCULATION

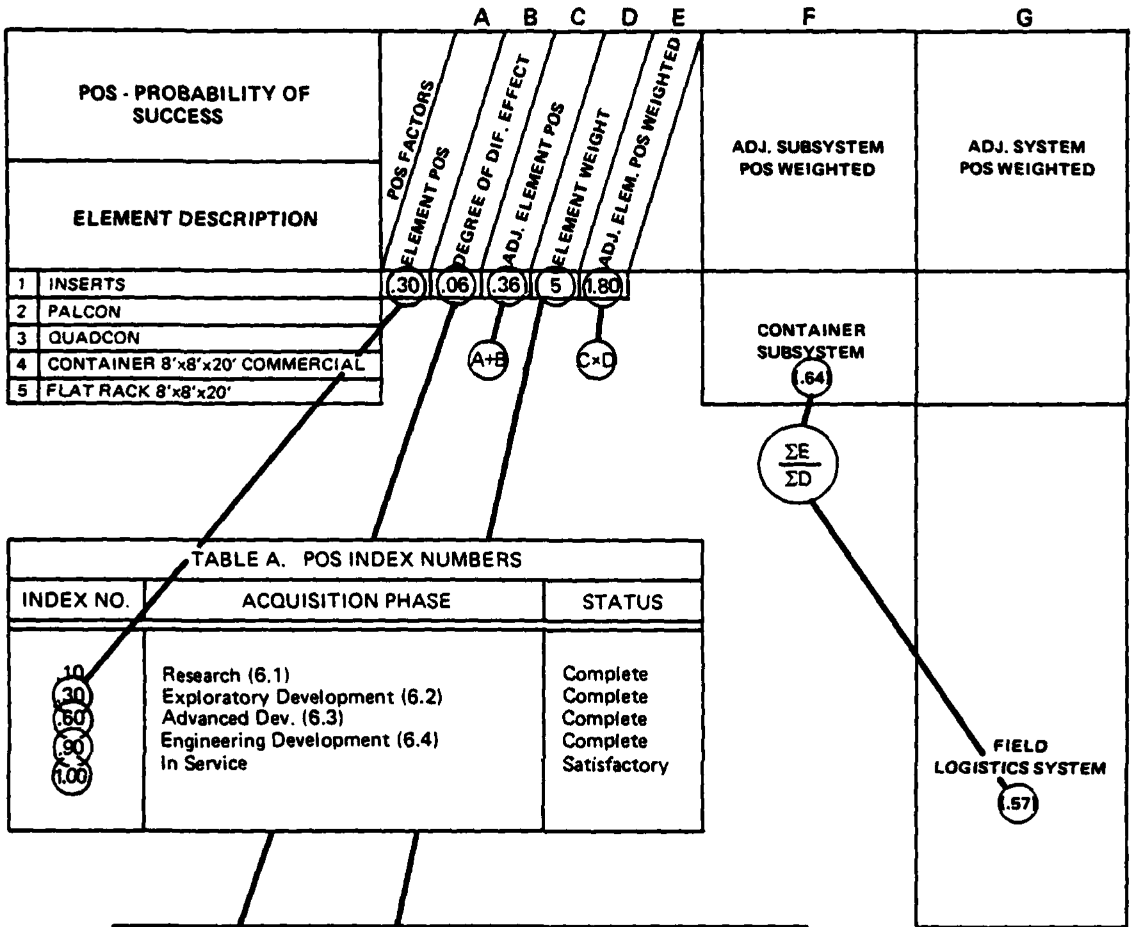


TABLE A. POS INDEX NUMBERS

INDEX NO.	ACQUISITION PHASE	STATUS
.10	Research (6.1)	Complete
.30	Exploratory Development (6.2)	Complete
.60	Advanced Dev. (6.3)	Complete
.90	Engineering Development (6.4)	Complete
1.00	In Service	Satisfactory

TABLE B. INDEX NUMBERS ADJUSTMENT CRITERIA

DEGREE OF DIF.	DESCRIPTION	EFFECT
1	Little Difficulty	Element POS + 20%
2	Average Difficulty	No Change
3	Significant Difficulty	Element POS–20%

TABLE C. ELEMENT INFLUENCE WEIGHTING

ASSIGNED WT.	DESCRIPTION
	Without this element, system effectiveness would be:
1	Slightly Diminished
2	Somewhat Diminished
5	Greatly Diminished
8	Completely Diminished

Figure 4–9. Sample Calculation

DATE: NOVEMBER 1980

(.68) - PROBABILITY OF SUCCESS

	ELEMENT DESCRIPTION	A POS FACTORS ELEMENT POS	B DEGREE OF DIFFICULTY EFFECT	C ADJ. ELEMENT POS	D ELEMENT WEIGHT	E ADJ. SUBSYSTEM POS WEIGHTED	F ADJ. ELEMENT POS WEIGHTED	G ADJ. SYSTEM POS WEIGHTED
1	INSERT	.30	.06	.36	8	2.88	CONTAINER (.82)	FIELD LOGISTICS SYSTEM (.68)
2	PALCON	.30	.06	.36	8	2.88		
3	QUADCON	.30	.06	.36	8	2.88		
4	CONTAINER 8x8x20	1.00	.20	1.20	8	9.6		
5	FLATRACK 8x8x20	.90	.18	1.08	8	8.64		
6	FLATRACK 8-1/2x8x40	.90	.18	1.08	8	8.64		
7	SHIPPING FRAME 8x8x10	.90	.14	1.04	5	5.2		
8	SHIPPING FRAME 4x6-2/3x8	.90	.14	1.04	5	5.2		
9	SHELTER 60x128	.90	0	.90	5	4.5	SHELTER (.73)	
10	SHELTER 32x73	.90	0	.90	5	4.5		
11	SHELTER 20x33	.90	0	.90	5	4.5		
12	SHELTER 8x8x20 KNOCKDOWN	.60	0	.60	5	3.0		
13	SHELTER 8x8x20 RIGID/GP	.60	0	.60	5	3.0		
14	SHELTER 8x8x20 EMI	.60	0	.60	5	3.0		
15	SHELTER 8x8x10 EMI	.60	0	.60	5	3.0		
16	SHELTER JOINING CORRIDOR 7x7x11	.60	0	.60	2	1.2		
17	SHELTER APPOINTMENTS	1.00	0	1.00	1	1.0		
18	HIGH MOBILITY MULTI-PURPOSE WHEELED VEHICLE (HMMWV)	.30	0	.30	2	.60	MOTOR TRANSPORT (.30)	
19	HEAVY HIGH MOBILITY TACTICAL TRUCK (HHMTT)	.90	0	.90	2	1.8		
20	MEDIUM PRIME MOVER	.30	0	.30	5	1.5		
21	HEAVY PRIME MOVER	.30	0	.30	5	1.5		
22	LOGISTICS TRAILER (12.5 TON)	.30	0	.30	5	1.5		
23	LOGISTICS TRAILER (22.5 TON)	.30	0	.30	5	1.5		
24	MOBILIZER/TRANSPORTER	.10	0	.10	5	.5		
25	SEMI TRAILER (65 TON)	.10	0	.10	1	.1		
26	ROUGH TERRAIN FORKLIFT (4,000 LB)	.90	0	.90	5	4.5	MHE (.78)	
27	ROUGH TERRAIN FORKLIFT (6,000 LB)	.90	0	.90	5	4.5		
28	ROUGH TERRAIN FORKLIFT (10,000 LB)	.90	0	.90	5	4.5		
29	ROUGH TERRAIN CRANE (30 TON)	1.00	0	1.00	5	5.0		
30	CONTAINER HANDLER	.10	0	.10	5	.5		
31	LIGHTWEIGHT AMPHIBIOUS CONTAINER HANDLER (LACH)	.90	0	.90	5	4.5		
32	BRIDGING, DRY GAP	.90	.18	1.08	1	1.08	SERVICE SUPPORT (.79)	
33	BRIDGING, WET GAP	.10	0	.10	1	.1		
34	MARINE CORPS ENVIRONMENT CONTROLLED MEDICAL SYSTEM (MCEMS)	.60	0	.60	2	1.2		
35	FUEL/WATER STORAGE MODULE	.60	0	.60	2	1.2		
36	FUEL PUMP MODULE	.60	0	.60	2	1.2		
37	WATER PURIFICATION SYSTEM	.90	0	.90	2	1.8		
38	SOIL STABILIZATION MODULE (AMSS)	.90	0	.90	1	.9		
39	FIRE FIGHTING EQUIPMENT	.10	-.02	.08	1	.08		
40	SANITATION UNIT	.30	0	.30	1	.3		
41	COMBINED LAUNDRY AND BATH UNIT (CLABU)	.30	-.02	.28	1	.28		
42	DUMP MODULE	.10	0	.10	1	.1		
43	REFRIGERATION SYSTEM	.60	0	.60	1	.6		
44	MOBILE ELECTRIC POWER DISTRIBUTION SYSTEM (MEPDIS)	.90	.14	1.04	2	2.08		
45	AIR CONDITIONERS	1.00	0	1.00	8	8.0		
46	ELECTRIC GENERATORS	1.00	0	1.00	8	8.0		
47	BULK LAUNDRY UNIT	.10	0	.10	1	.1		
48	BATH/SHOWER UNIT	.10	0	.10	1	.1		
49	MARINE CORPS FIELD FEEDING SYSTEM (MFFS)	.30	0	.30	1	.3		
50	BAKERY SYSTEM	.30	-.02	.28	1	.28		
51	SCRAPER, EARTHMOVING	.60	0	.60	2	1.2		
52	TRACTOR, FULL-TRACKED	.60	0	.60	2	1.2		
53	LUBRICATION SERVICE UNIT	.60	0	.60	5	3.0		
54	STEAM CLEANER UNIT	.30	0	.30	2	.6		
55	AMPHIBIOUS ASSAULT FUEL SYSTEM (AAFS)	1.00	0	1.00	8	8.0		
56	TACTICAL AIRFIELD FUEL DISPENSING SYSTEM (TAFDS)	1.00	0	1.00	8	8.0		
57	HELICOPTER EXPEDIENT REFUELING SYSTEM (HERS)	1.00	0	1.00	8	8.0		

Figure 4–10. FLS Risk Matrix

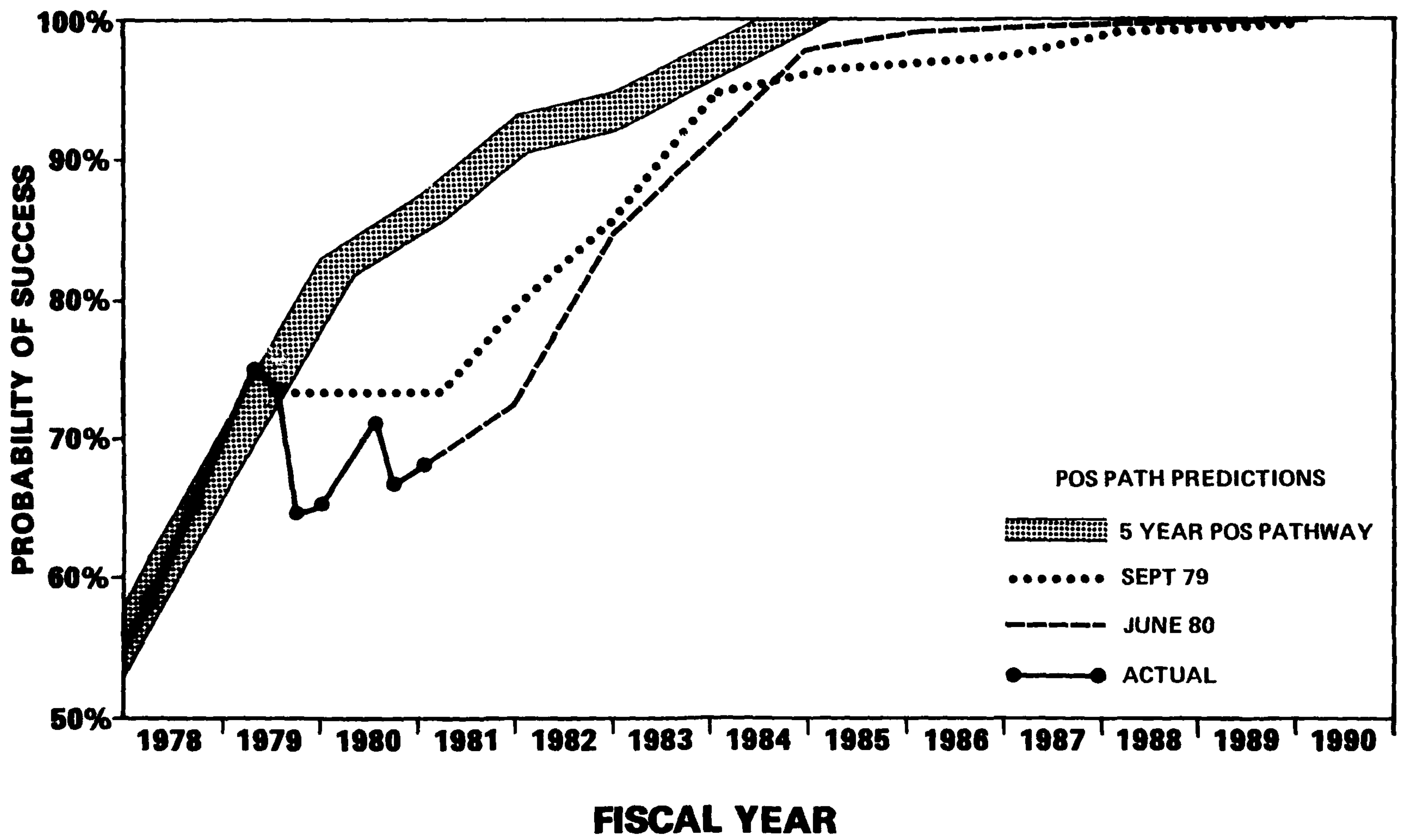


Figure 4-11. FLS All Systems POS

Table 4-3. Risk Analysis Historical POS Data Development (April 1978—November 1980)

Date	Container	Shelter	MT	MHE	Service Support	FLS
Apr 78	64	66	30	76	53	58
Oct 78	68	66	36	78	79	65
Apr 79	67	79	44	94	86	75
Jul 79	67	79	39	95	87	74
Sep 79	67	79	10	91	77	65
Dec 79	71	79	10	91	78	66
Jun 80	82	73	28	92	78	71
Aug 80	82	73	28	78	76	67
Current	82	73	30	78	79	68

to, changes in priority, reallocation of funds, revision of PWDs, rewriting task statements and redirection of work, and cancellation of an item from FLS or its addition thereto.

Managerial System Risk/Assessment. Risk analysis data, when considered with other program assessment information which might include logistics concepts, manpower, training, maintenance and equipment evaluations, forms a comprehensive basis for managerial judgment and decisionmaking.

Beyond the technical probability of success considerations, a continuing assessment is required of all facets of the system's operational nature and their limiting factors. Operational considerations may be discussed in terms of item quantity, size or the magnitude of personnel skill/machine intensity required for the erection, disassembly, displacement, handling or transport of FLS components, equipment or subsystems, particularly as sequentially or concurrently needed within the AOA.

Discrete analysis of pertinent physical limits and operational parameters associated with equipment requirement statements is necessary to determine optimum quantities of FLS elements that are compatible with the characteristic feasibility, mobility, and maneuverability of FMF operations in the field.

FLS Program Management Reviews. Formal, bimonthly program reviews are conducted. Presentations are made to the Head, C&RO, by cognizant staff members. Representatives from HQMC and other government agencies and contract representatives attend as appropriate. The purpose of these reviews is to provide a comprehensive overview of the status of the FLS program to all participating and responsible parties.

The management review agenda will normally include, but is not necessarily limited to, the following:

- Status of FLS program milestones (appendix C)
- Independent evaluation of the program's progress based upon analysis of reports submitted and program reviews
- Report on planning status
- Report on financial status
- Report on test and evaluation status
- Review of problem areas
- Special presentations may also be made by other offices and contractors

Acquisition Coordinating Group (ACG). Positive management of the system acquisition program is further assured by conducting ACG meetings involving the Acquisition Sponsor Project Officer, Acquisition Project Officer, Development Coordinator, Development Project Officer, and Operational Test Project Officer. The function of the ACG is to facilitate the exchange of information, plan, and coordinate matters affecting the progression of the system in each phase of the acquisition process as well as to recommend changes to the program sponsor for approval.

4.3 SCHEDULING

Scheduling is the bridge from the planning stage to coordinated, effective program implementation. It is the transition of the plan, with its elapsed time estimates, into calendar time. The goal of scheduling is to produce a calendar time-phased plan that is consistent with the desired completion dates for the assigned objectives. It serves as a basis for the continous evaluation of progress.

4.3.1 Milestones

Milestones provide both management and R&D personnel with a schedule that indicates current project status, the remaining tasks, and the sequence for their completion.

In order to provide the details necessary for successful completion of FLS implementation, yet hold the amount of data to a manageable level, three levels of milestones have been developed. These are as follows:

- Level I—Pertinent to higher authority requirements
- Level II—For principal use by the Head, C&RO
- Level III—For principal use by first tier managers

In order to provide an uncomplicated and consistent milestone presentation form, a basic format and symbols have been developed and are used at all three levels. Level I indicates the quarterly status of the FLS subsystems; container, shelter, motor transport,

material handling equipment and service support. Level II indicates the status of each element of a subsystem, i.e., insert, 20'x33' shelter, or logistics trailer. Figure 4–12 is an example of the first and second level milestones which are updated quarterly. Figure 4–13 shows the third level in the same basic format as figure 4–12 except that it is expanded to include more detail. Figure 4–14 is a summary chart that provides an overview of the entire program.

Appendix C contains the current quarterly summary chart and the completed first, second, and third level milestone charts. In addition, the documentation matrix which highlights the subsequent documents necessary for continued milestone achievement is also included in appendix C.

4.3.2 <u>In-Service Dependency Network</u>

FLS equipment procurement is scheduled as a result of the coordination and integration of projected availabilities and dependencies on other FLS elements with the remaining useful life of the existing items that they will replace. Because of the stated objective of implementing the FLS by 1990, it has sometimes been necessary to schedule procurements of interdependent elements close together. This results in minimum time to handle contingencies and dictates that an effective means for providing advance notice of potential problems be available for the manager to make necessary adjustments. The Scheduled In-Service Dependency Network Matrix, figure 4–15, lists all the FLS elements. It provides an overview of the entire system to include each element's scheduled in-service date, interdependencies with other elements, and potential in-service scheduling conflicts.

The chart depicts a solid dot for each element that indicates the fiscal year and quarter of its scheduled in-service date. On line with these dots are the element numbers of other FLS equipment that are adjudged to have a critical dependency relationship. These numbers are positioned according to the in-service date scheduled for their respective element, also by fiscal year and quarter.

If the number appears to the left (or chronologically earlier) than the solid dot, a conflict in scheduling can be anticipated. In such an instance, the element represented by the number will be in service prior to the equipment upon which it is dependent, represented by the solid dot.

The importance of the scheduling conflict can then be evaluated and remedial actions or alternatives can be established.

These in-service dates, as well as the quantities associated with the scheduled procurements, remain tentative in most cases. After the individual element successfully progresses through the final acquisition decision milestone, procurement data is better established and a more definitive "in-service" date can be developed. Because of their significant

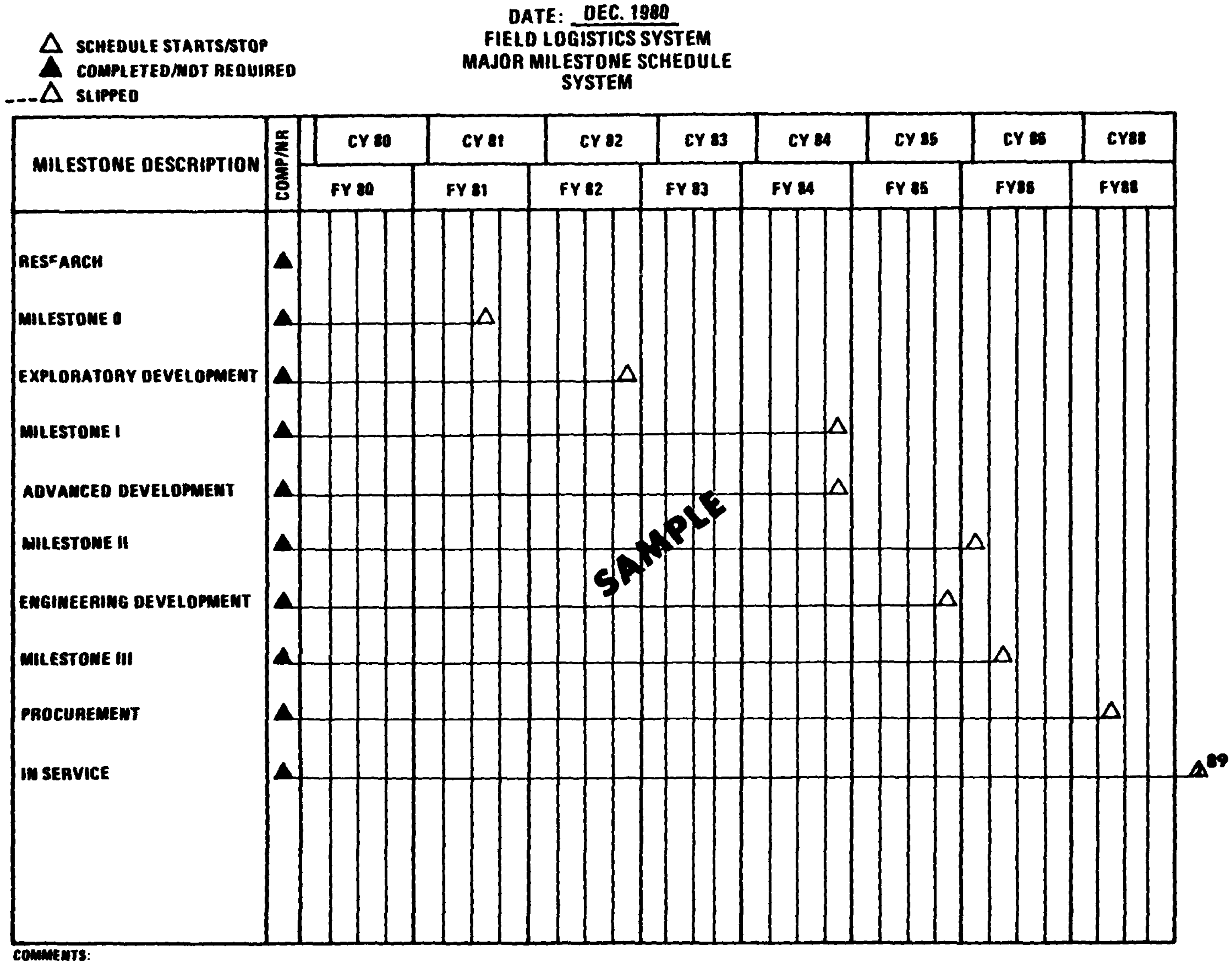


Figure 4-12. FLS Major Milestone Schedule—Levels I & II

DATE________

△ SCHEDULED COMPLETION
▲ COMPLETED/NOT REQUIRED (NR)
____△ SLIPPED

MILESTONES
FIELD LOGISTICS SYSTEM
ELEMENT NO. DESCRIPTION/TITLE

MILESTONES	COMP/NR	FY 19 __	FY 19 __	FY 19 __	REMAIN
RESEARCH (6.1) – STUDIES – EXPERIMENTAL HARDWARE – SIMULATION/INVESTIGATION MILESTONE 0 EXPLORATORY DEVELOPMENT (6.2) – DEVELOPMENT CONTRACT – DEVELOPMENT SPECIFICATIONS – EXPERIMENTAL/BREADBOARD HARDWARE – SIMULATION/INVESTIGATION					
MILESTONE I ADVANCED DEVELOPMENT (6.3) – DP (DEVELOPMENT PLAN) – FEASIBILITY DEMONSTRATION AND TESTS – TEST & EVALUATION PLAN – DEVELOPMENT/OPERATIONAL TEST & EVALUATION (DTI/OTI)					
MILESTONE II ENGINEERING DEVELOPMENT (6.4) – DEVELOPMENT CONTRACT – PROTOTYPES/PILOT PRODUCTION MODELS					

SAMPLE

Figure 4–13. FLS Major Milestone Schedule—Level III (Sheet 1 of 2)

DATE______

△ SCHEDULED COMPLETION
▲ COMPLETED/NOT REQUIRED (NR)
____△ SLIPPED

MILESTONES
FIELD LOGISTICS SYSTEM
ELEMENT NO. DESCRIPTION/TITLE

MILESTONES	COMP/NR	FY 19 __				FY 19 __				FY 19 __				REMAIN
MILESTONE II (CONT'D)														
– ILSP APPROVED														
– DEVELOPMENT T&E (DT II)														
– INITIAL OPERATIONAL T&E (OT II)														
MILESTONE III														
– ASU (APPROVAL FOR SERVICE USE)														
PROCUREMENT (PMC)														
– PWO (PROCUREMENT WORK ORDER) INITIATED														
– MIPR/MCPR RELEASE														
– PRODUCTION CONTRACT AWARD														
– 1ST ARTICLE TEST/ACCEPTANCE														
– PROVISIONING INITIATED														
– FULL SCALE PRODUCTION														
– 1ST DESTINATION INITIAL DELIVERY														
– MARINE CORPS SUPPORT DATE*														
– INITIAL ISSUE														
– IN SERVICE														

SAMPLE

* SUFFICIENT SUPPORT AVAILABLE TO RENDER THE EQUIPMENT OPERATIONAL.

Figure 4–13. FLS Major Milestone Schedule—Level III (Sheet 2 of 2)

FIELD LOGISTICS SYSTEM MAJOR MILESTONE SUMMARY

DECEMBER 1980

DATE — SCHEDULE
COMPLETED
NOT REQUIRED

#	ITEM	MILESTONE 0	EXPLORATORY DEVELOPMENT	MILESTONE I	ADVANCED DEVELOPMENT	MILESTONE II	ENGINEERING DEVELOPMENT COMPLETED	MILESTONE III	CONTRACT AWARD	IN-SERVICE	MILESTONE 1ST QTR FY 81
1	INSERT			1-81	3-81	4-81	4-82	4-82	3-83	4-84	X
2	PALCON			1-81	3-81	4-81	4-82	4-82	3-83	4-84	X
3	QUADCON			1-81	3-81	4-81	4-82	4-82	3-83	4-84	X
4	CONTAINER 8x8x20								AS REQUIRED		
5	FLATRACK 6x6x20								3-82	4-83	
6	FLATRACK 8-1/2x8x40								3-82	4-83	
7	SHIPPING FRAME 8x8x10							1-81	3-81	3-82	X
8	SHIPPING FRAME 4x6-2/3x8							1-81	2-84	3-85	X
9	SHELTER 60x128									3-83	
10	SHELTER 32x73									3-83	
11	SHELTER 20x33									2-83	
12	SHELTER 8x8x20 KNOCKDOWN						3-81	4-81	4-82	3-84	
13	SHELTER 8x8x20 RIGID/GP						3-81	4-81	4-82	1-85	
14	SHELTER 8x8x20 EMI						3-81	4-81	4-82	1-85	
15	SHELTER 8x8x10 EMI						3-81	4-81	4-82	1-85	
16	SHELTER JOINING CORRIDOR 7x7x11						3-81	4-81	4-82	3-84	
17	SHELTER APPOINTMENTS								AS REQUIRED		
18	HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE (HMMWV)			1-81	2-82	2-82	3-82	4-82	1-83	4-84	X
19	HEAVY HIGH MOBILITY TACTICAL TRUCK (HHMTT)(M939)								2-81	1-83	
20	MEDIUM PRIME MOVER				3-83	4-83	1-85	1-85	2-85	2-86	
21	HEAVY PRIME MOVER				4-81	1-82	2-83	2-83	3-83	4-84	
22	LOGISTICS TRAILER (12.5 TON)				3-83	4-83	1-85	1-85	2-85	2-86	
23	LOGISTICS TRAILER (22.5 TON)				4-81	1-82	2-83	2-83	3-83	4-84	
24	MOBILIZER/TRANSPORTER	1-81	4-81	1-82	3-82	1-83	3-83	4-83	2-84	4-84	X
25	SEMITRAILER (65 TON)		2-81	2-81	4-83	4-83	4-85	4-85	2-87	2-89	
26	ROUGH TERRAIN FORKLIFT (4,000 LB)								2-81	1-82	
27	ROUGH TERRAIN FORKLIFT (6,000 LB)									1-82	
28	ROUGH TERRAIN FORKLIFT (10,000 LB)									2-81	
29	ROUGH TERRAIN CRANE (30 TON)										
30	CONTAINER HANDLER	3-81	3-81	3-81	1-82	1-82	3-83	4-83	3-84	3-85	
31	LIGHTWEIGHT AMPHIBIOUS CONTAINER HANDLER (LACH)								4-81	1-83	
32	BRIDGING, DRY GAP								2-82	4-83	
33	BRIDGING, WET GAP	1-81	3-81	3-81	2-82	2-82	4-83	4-83	2-84	4-85	X
34	MARINE CORPS ENVIRONMENT CONTROLLED MEDICAL SYSTEM *(MCEMS)						3-81	3-81	2-82	3-83	
35	FUEL/WATER STORAGE MODULE					2-81	4-82	4-82	2-84	3-85	
36	FUEL PUMP MODULE					2-81	4-81	4-81	2-84	3-85	
37	WATER PURIFICATION SYSTEM								3-81	3-82	
38	SOIL STABILIZATION MODULE (AMSS)							2-81	2-84	3-85	
39	FIREFIGHTING EQUIPMENT	3-81	4-82	1-83	4-83	1-84	4-85	1-86	2-87	3-88	
40	SANITATION UNIT				1-81	2-81	1-83	4-83	2-84	3-85	X
41	COMBINED LAUNDRY AND BATH UNIT (CLABU)				1-82	2-82	1-84	2-84	2-84	3-85	
42	DUMP MODULE	3-81	3-84	4-84	4-85	1-86	3-86	3-86	4-86	3-87	
43	REFRIGERATION SYSTEM						4-81	1-82	3-82	3-83	
44	MOBILE ELECTRIC POWER DISTRIBUTION SYSTEM (MEPDIS)								2-81	3-82	
45	AIR CONDITIONERS										
46	ELECTRIC GENERATORS										
47	BULK LAUNDRY UNIT	1-81	1-81	1-81	3-81	4-81	1-83	3-83	4-83	1-85	X
48	BATH/SHOWER UNIT	2-81	2-81	2-81	2-81	2-81	4-81	1-82	TBD	TBD	
49	MARINE CORPS FIELD FEEDING SYSTEM (MFFS)			2-81	2-81	2-81	3-83	4-83	2-84	4-85	
50	BAKERY SYSTEM			4-81	1-83	2-83	2-84.	3-84	2-86	4-87	
51	SCRAPER, EARTHMOVING						2-81	4-82	3-83	3-84	
52	TRACTOR, FULL-TRACKED						2-81	4-81	3-82	3-83	
53	LUBRICATION SERVICE UNIT						4-81	4-81	1-82	2-83	
54	STEAM CLEANER UNIT				4-81	3-83	3-84	1-85	2-86	2-87	
55	AMPHIBIOUS ASSAULT FUEL SYSTEM (AAFS)										
56	TACTICAL AIRFIELD FUEL DISPENSING SYSTEM (TAFDS)										
57	HELICOPTER EXPEDIENT REFUELING SYSTEM (HERS)										

*FIRST PORTION OF SYSTEM ONLY

Figure 4–14. FLS Major Milestone Summary

SCHEDULED IN-SERVICE DEPENDENCY NETWORK MATRIX

ELE NO	NOUN NAME	FY80				FY81				FY82				FY83				FY84				FY85				FY86				FY87				FY88				FY89				FY90				REMARKS
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
1	[illegible]																				●																									ASSOCIATED W/ ELEMENTS 2 & 3
2	FALCON																				●																									
3	[illegible]	56										44									●																									
4	CONTAINER 8'x8'x20'																																													AS REQUIRED
5	FLATRACK 8'x8'x20'														11	10	●			16																										
6	FLATRACK 8½'x8'x40'															9	●																													
7	SHIPPING FRAME 8'x8'x10'	45 46										● 37																								39										
8	SHIPPING FRAME 4'x6-2/3'x8'	45 46																						● 35 36 38																						
9	SHELTER 40'x120'															●																														
10	SHELTER 32'x73'															●																														
11	SHELTER 20'x33'														●																															
12	SHELTER 8'x8'x20' [illegible]																			●					49																					
13	SHELTER 8'x8'x20' [illegible]																					● 47		40 41									50													
14	SHELTER 8'x8'x20' [illegible]																					●																								
15	SHELTER 8'x8'x10' [illegible]																					●																								
16	SHELTER (JC) 7'x7'x11'																			●																										
17	SHELTER APPTS																																													AS REQUIRED
18	TRUCK [illegible]																				●															39										
19	TRUCK [illegible]											7		●										8												39										
20	MEDIUM PRIME MOVER																										● 22																			
21	HEAVY PRIME MOVER																				● 23 24						22												25							
22	LOG TRLR (12.5-TON)	55 56 57										7				43				12	2 3	13 14 16		8 40 41			●																			
23	LOG TRLR (22.5-TON)																5				●			8								42														
24	[illegible]/TRANSP.																5 6				●																									
25	SEMITRAILER [illegible]															52				51																			●							
26	FORKLIFT (RT) (4K)									●																																				
27	FORKLIFT (RT) (6K)									●											2			8																						
28	FORKLIFT (RT) (10K)						●					7				43	5				3	13 14 15		40 41								42														
29	CRANE [illegible]	●										7			11	9	5																													

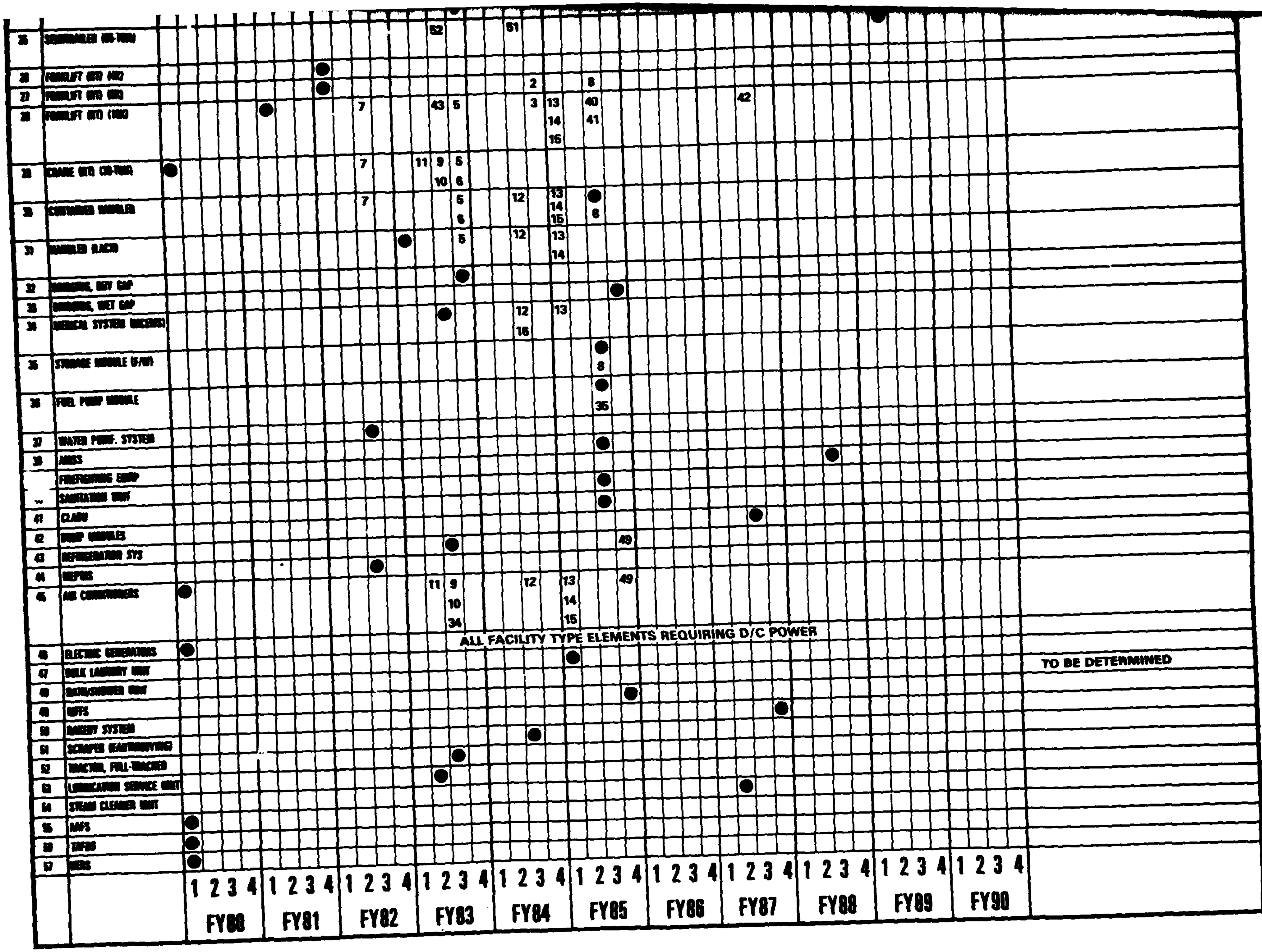


Figure 4-15. Scheduled In-Service Dependency Network Matrix

2

interrelationships, FLS elements require a well-coordinated procurement/production cycle in order to preclude an adverse impact on equipment in-service scheduling and to avoid impairment of the final FLS implementation.

4.4 REPORTS

Incoming reports are screened by ASPOs and actual progress is compared with the implementation plan. Exceptions to the plan are noted and reported to the Head, C&RO. The following information is required by ASPOs to enable them to accurately evaluate program performance. However, much of this data will also be used extensively by other program personnel. These data items include:

- A work breakdown structure consonant with the requirements of MIL-STD-881 for the reporting activities' respective acquisition efforts, including changes thereto as the scope of work changes.
- Dependency networks reflecting the critical interface relationships of the reporting activities' efforts. Timely submission of revisions to these networks are to be made as significant changes occur. (In the absence of external support, the Operations/Assessment Officer will take primary cognizance of dependency conflicts in conjunction with associated ASPOs.)
- Problem analysis reports submitted by the prime contractors' laboratories and supporting activities/agencies. These narratives should address any problems which could impact upon program objectives, including any potential degradation in technical efficiency and impact on schedules. As a minimum, they must include:
  - Identification of equipment/component/system
  - Problem description
  - Issues involved
  - Corrective action taken, in process, or planned
  - Outlook for success/failure of remedial action including change in prognosis if problem previously reported
- Reports required by PWDs and similar task assignments.

CHAPTER 5

DATA MANAGEMENT

5.1 INTRODUCTION

Within the larger context of Marine Corps Data Management (DM), the FLS DM program provides for the accurate determination of program requirements and orderly acquisition of data essential for effective design, development, procurement, deployment, and life-cycle support of the FLS. Included in this DM process are the review and validation of prepared and/or procured data and the distribution, storage, maintenance, and ultimate disposition of these data. This chapter describes the responsibilities and procedures used in FLS DM to ensure that the data supporting each FLS element are complete, accurate, and timely.

5.2 PURPOSE

The purpose of this data management plan is to ensure the requisite data support of FLS equipment from development through deployment by providing accessible records of management decisions, end-item characteristics, production progress, and equipment status. Specifically, FLS data perform the following functions:

- Provide historical perspective and program progress audit capability.
- Substantiate and document management decisions.
- Provide visibility to higher authority and other services.
- Allow for input of changing concepts, policies, and materiel requirements to the FLS as presently defined.
- Provide the basis for ensuring continuing support to the end items that comprise the FLS.

To these ends, FLS related administrative/management, financial, and technical data of various types and forms must be selected, acquired/prepared, reviewed, distributed, stored, and maintained.

5.3 DEFINITIONS

FLS data fall into three distinct groups as noted in MCO P4000.21A and discussed below.

5.3.1 Administrative/Management Data

Those data necessary to manage and enforce contractual requirements, establish the basis for approval of each developmental item's passage through the various acquisition phases, and record the daily conduct of FLS business are considered administrative/management data. Specifically, correspondence, directives, policy statements, trip reports, program reviews, Acquisition Coordination Group (ACG) or Integrated Logistic Support Management Team Meeting Minutes, requirement documents and similar items that reflect the daily administration of the FLS program are contained in this group. Administrative/management of the FLS program is discussed in Chapter 4 of this plan. For purposes of DM, all administrative/management data will be stored by the DPO/ASPO/APO, as applicable, in accordance with the Marine Corps records management system through use of assigned Standard Subject Identification Codes (See MCO 5210.11).

5.3.2 Financial Data

Cost and accounting information and fiscal requirement estimates, such as inputs to the Program Objective Memoranda (POMs); POM initiatives; budget exhibits; appropriation, apportionment and reprogramming data; and cost factor records are categorized as financial data. The Operations and Assessment Officer, Code LM-2, is responsible for coordinating the development, review, and maintenance of data which are addressed in Appendix B of this plan.

5.3.3 Technical Data

Data that record the evolution of an engineering concept into firm design and performance requirements, that which provide the baseline for product fabrication and for compatibility assessment, and data that coordinate operational requirements are included in this group.

Technical data is defined by DOD Instruction 5010.12 as "recorded information used to define and to produce, support, maintain or operate items of defense material." These data include graphics, drawings, photographs, materiel lists, plans, specifications, standards, studies, manuals, reports, correspondence, and handbooks. Technical data are exclusive of both administrative/management and financial data. This plan will specifically address technical data acquisition and maintenance.

5.4 DATA MANAGEMENT RESPONSIBILITIES

5.4.1 General

The functions and responsibilities of personnel/activities involved in systems acquisition and data management during these acquisitions are enumerated in MCOs P5000.10 and

P4000.21A, respectively. The personnel, activities, and groups which are key to the FLS program data flow process are identified and their roles described herein.

5.4.2 Data Management Officer (DMO)

Within HQMC, the key data management figure is the Data Management Officer (DMO). Based on logistic element requirements, as expressed by the cognizant managers, the DMO aids in preparation and review of the Contract Data Requirements Lists (CDRLs), serves as secretary to the Technical Data Requirements Review Board (TDRRB), reviews proposed contractual changes prior to their approval for data requirements validity, and maintains the data item cost data bank.

The DMO responsibility and authority are resident within the Installations and Logistics Department (Code LMA-1).

5.4.3 Acquisition Sponsor Project Officer (ASPO) Responsibilities

For elements under his cognizance, the ASPO serves as the liaison between Code LM-2 and those activities involved in the system acquisition process through the production/procurement phase. During element development, the ASPO monitors its status, ensures the preparation of requirements documentation, and maintains status tracking procedures on plans and engineering data. Following Milestone III/ASU or an equivalent review, the ASPO transfers FLS item monitoring and recordkeeping responsibilities to the APO.

5.4.4 Development Project Officer (DPO) Responsibilities

The DPO has DM development/acquisition responsibilities for FLS items under his purview commencing with the approval for formal program initiation and continuing thereafter until the equipment is approved for service use and procurement. At that point, DM responsibilities are transferred to the APO. The DPO is tasked to establish a data file at program initiation.

The DPO is responsible for collecting and ensuring the adequacy of all technical data generated in the course of the FLS item's research and development cycle.

5.4.5 Acquisition Project Officer (APO) Responsibilities

The APO executes DM responsibilities for FLS items under his purview commencing with the procurement phase of the acquisition process. These responsibilities continue not only through the procurement phase but throughout the life cycle of the item. During this period, the APO is responsible for the following DM related functions:

- Initiating the procurement process by requesting issuance of a Procurement Work Order.
- Performing a technical adequacy/completeness review of existing data sets when applicable.

- Acquiring data sets for distribution to prospective bidders, when applicable.
- Monitoring the status of contractor data deliveries against the schedule established in the contract.
- Performing acceptance reviews with regard to technical accuracy of delivered data, when specified by the CDRL.
- Recording the receipt and/or delinquency of data and taking corrective action in the latter case.
- Ensuring proper distribution of incoming data.
- Evaluating Quality Deficiency Reports (QDRs) and, in conjunction with Code LMA-1, determining the need for Engineering Change Proposals (ECPs) based on those QDRs.
- Participating in ECP review and monitoring the incorporation of changes in the end items and data, including the development of technical orders.
- Developing separate packaging/packing instructions for MCLBs Albany and Barstow, when applicable.
- Publishing the Advance Logistics Order (ALO) and updating the Integrated Logistics Support Plan (ILSP).
- Monitoring the ready-for-issue/in-service status of equipment.
- Ensuring the existence of a reprocurement-level data package.

Additionally, the APO ensures that the ultimate storage location of the technical data is documented. Through his maintenance of data status charts, the APO provides a quick retrieval capability and an audit trail designed to minimize the impact of personnel changes during the FLS program life cycle, while ensuring continuous utility of information accumulated at earlier stages of the program.

In the execution of these functions, APOs will coordinate with the DMO with regard to data requirements.

5.4.6 Technical Data Requirements Review Board (TDRRB)

For procurements exceeding $1 million, the HQMC TDRRB reviews data requirements identified with an end-item procurement to ensure their essentiality. Data requirements, quantities, and formats are reviewed by the TDRRB for completeness, technical comprehensiveness, and cost-effectiveness. Of particular concern to the TDRRB is the requirement for reprocurement data sufficiency, which includes the necessity to buy "rights-in-data." The APO will be present at the data requirements review. The TDRRB composition and operation is described in Headquarters Order 5420.32.

5.5 DATA ACQUISITION/CONTROL SYSTEM

A key objective of the FLS DM program is to obtain and ensure the maintenance of an end item reprocurement-level data package and associated supporting data to enable competition during procurement and to enhance readiness of the item in the field. The following sections outline the necessary steps to acquire FLS data at the level of intended use. These sections address Marine Corps-developed data only.

5.5.1 Review of Existing Data

Data developed prior to Milestone III undergo a review by the APO prior to use for procurement. This review examines existing data versus that indicated as being required for procurement and ensures that approved changes made during development have been incorporated into the data package. It also verifies that the Government owns or can obtain the rights-in-data. Figure 5-1 illustrates the APO's technical adequacy/completeness review of existing data. Insufficient data packages will be supplemented by the preparation of supplemental data prior to procurement or the ordering of data as part of the end item procurement action.

5.5.2 Preparation of the Procurement Package

Materiel Division Order 4200.1 and Installations and Logistics Order 4270.1 establish detailed procedures for preparation of procurement documentation which stipulates detailed equipment and data requirements. Further, it prescribes the method of obligating funds for their procurement. Following this guidance, the APO prepares the procurement package for FLS equipment approved for service use. Listed below are the documents that comprise the procurement package.

- Acquisition Requirements Addendum (ARA)-1
- Justification for Sole Source Procurement (optional)
- Justification for Exception to Buy American Act (optional)
- Justification for Single (v. Multiple) Award (optional)
- Provisioning Guidance Data—Part 2 (PGD–2)
- Provisioning Requirements Statement
- Addendum to Provisioning Requirements Statement, DD Form 1949–2
- Provisioning Technical Documentation Data Selection Sheet, DD Form 1949–1
- Provisioning Performance Schedule
- Contract Data Requirements Lists (CDRLs), DD Form 1423
- Data Item Descriptions (DIDs), DD Forms 1664, one per matching CDRL item
- Part II: Management Data
- Part III: Technical Data

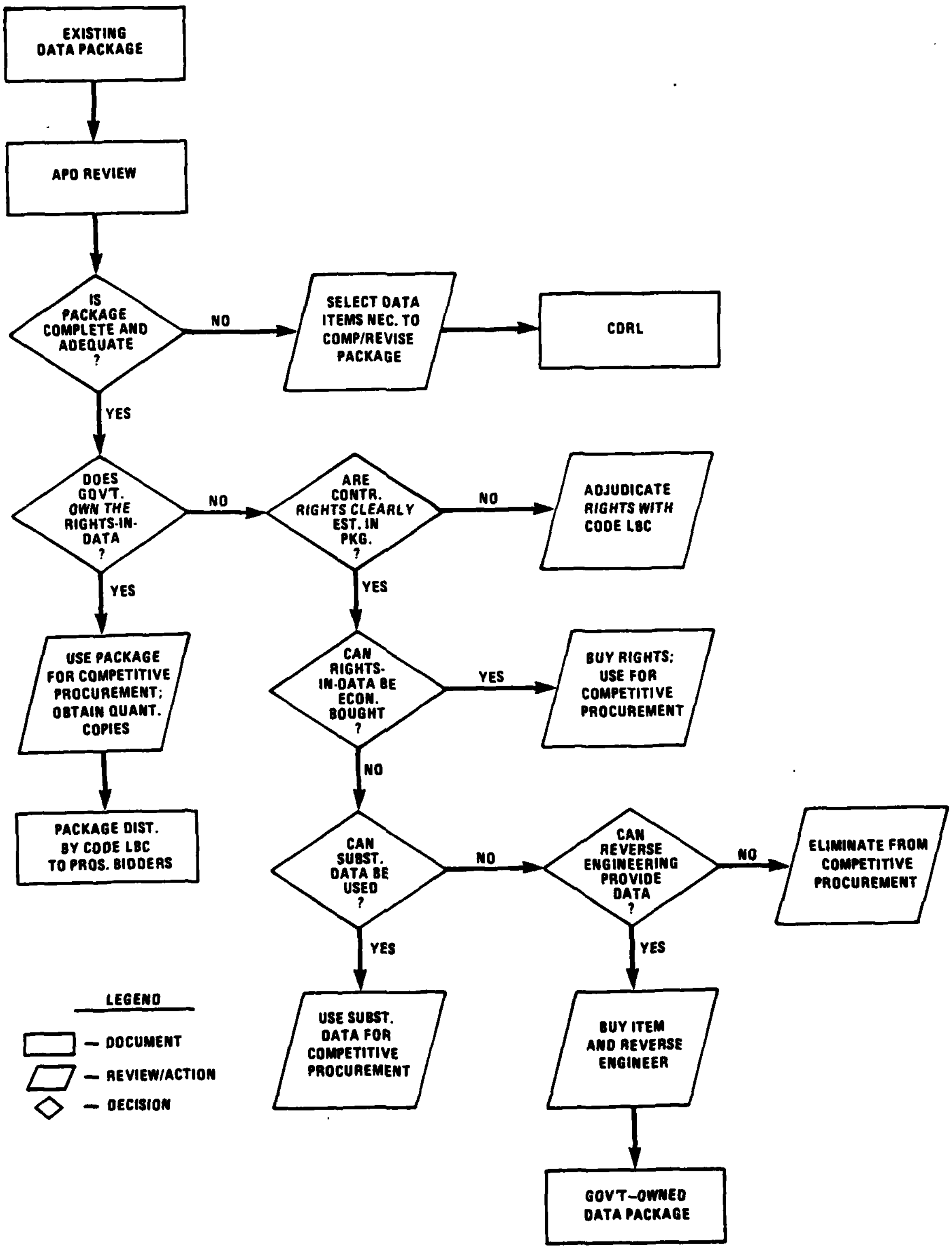


Figure 5-1. Data Package Status Review

- Technical Data Requirements Review Board Summary Sheet (optional)
- Cataloging Action Requests (CARs), one per NSN, Marine Corps direct procurements only

Figure 5-2 presents a detailed flowchart of functions performed prior to procurement. These actions are necessary to acquire supplemental support data, consolidate the data for review, and process those requirements through the approval cycle.

Upon completion by the APO, the procurement package is forwarded to Codes LMA-1 and LMA-4 for reliability, maintainability, and supportability review. Following the TDRRB meeting and decisionmaking process, when applicable, the package is forwarded to Code LMB for issuance of the appropriate funds commitment document (Military Interdepartmental Procurement Request (MIPR), Marine Corps Procurement Request (MCPR), or Project Order)), which obligates the funds for procurement. At this point, the package is passed to Code LBC or other military service to arrange for contracting support. A quality assurance representative is normally assigned by the Defense Contract Administration Services (DCAS) and, when applicable, the other Service, to serve as liaison between the contractor and Code LPS/APO. Following bid solicitation and during bid package review, the APO is an active participant in the proposal review team formed by Code LBC.

5.5.3 Ordering Data

Concurrent with Code LMA-1 review of the procurement package, the DMO issues a data call to Code LMA-1 logistic element managers (LEMs) requesting identification of Data Item Descriptions (DIDs) that should be listed on the CDRL (DD form 1423). DIDs are documented on DD forms 1664. They detail the content, format, and frequency of delivery of contractually prepared data, e.g., reports, lists, manuals, drawings, specifications, illustrations, etc. The Acquisition Management Systems and Data Requirements Control List (AMSDL), TD-3, is the index for DIDs. It lists possible data requirements by the following categories:

- Administration/management
- Engineering and configuration documentation
- Financial
- Human Factors
- Logistics support
- Technical publications
- Procurement/production
- Related design requirements
- System/subsystem analyses
- Tests

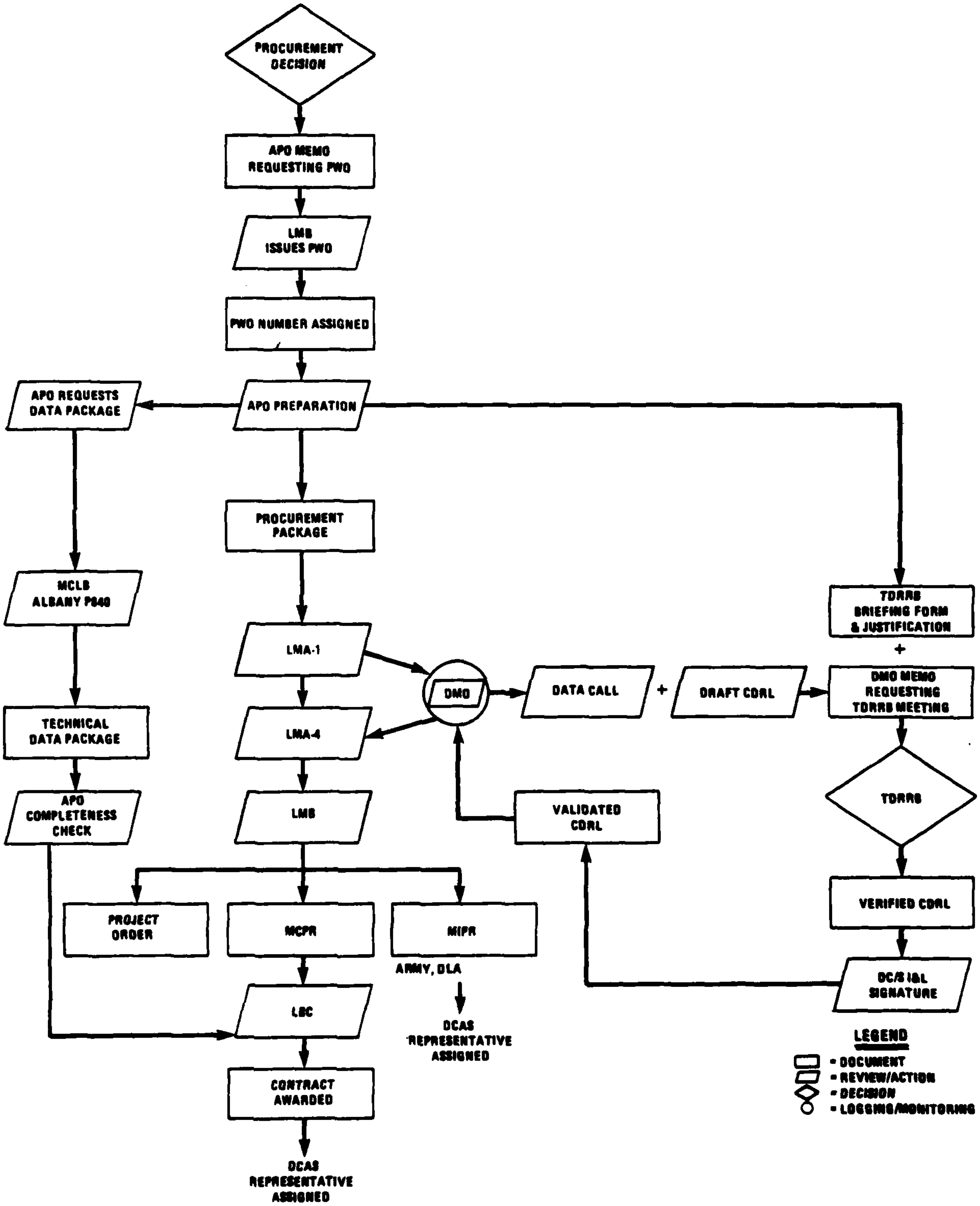


Figure 5-2. Procurement Package Preparation and Review

- Provisioning
- Miscellaneous unique items*

Particular data items required to support FLS elements depend upon the nature of the individual elements and their particular stage of development. Figure 5-3 lists the data items required to support noncommercial items and illustrates the stage of acquisition during which they should be prepared/procured.

The DMO reviews LEM-provided CDRL requirements against those in the APO-prepared CDRLs and submits the CDRLs to the TDRRB for review. The TDRRB reviews and verifies the cited data items, ensures the absence of redundancy and verifies the APO's decision regarding purchase of rights-in-data. The TDRRB findings are then forwarded to the DC/S I&L for signature approval. An approved and validated CDRL is the product of this review process. Following TDRRB review, the CDRL becomes a part of the procurement package and ultimately the contract, MIPR, or Project Order. It is against these approved requirements that the APO monitors data deliveries.

5.5.4 Data Development Status Reports

Following contract award, status charts will be maintained by the APO to reflect data scheduled for receipt in accordance with milestones in the contract. Tracking will be done on the form shown in figure 5-4.

The "Remarks" column will be used by the APO to record impacts of data delinquencies and the acceptance and disposition of delivered data items.

5.5.5 FLS Delivered Data Review Cycle

Following the DCAS initial receipt and quality review, the data are delivered according to contractual specifications. The APO maintains an accurate record of the location of all data which are under review, as shown in figure 5-4. Figure 5-5 illustrates the review process for FLS delivered data items.

5.6 DATA STORAGE AND RETRIEVAL

The FLS DM system utilizes a series of decentralized storage sites that contain data defined by the ASPO/APO in the Technical Documentation Record (figure 5-6) that is maintained for each FLS element. Here, the supporting technical data for each element are described in terms of function (such as quality assurance, maintenance, test procedures, test reports, design/performance, compatibility/interface requirements, etc.); documents required for each function; corresponding DID by which the item is prepared with a special notation for DIDs that are tailored; document identification number and title; document

*A unique data item (UDI) is developed by Code LMA-1 in coordination with the cognizant APO when there is no existing DID to address the specific need.

DEVELOPMENTAL DISCLOSURE DATA		DESIGN DISCLOSURE DATA		
PROGRESS	ENGINEERING PROGRESS REPORTS	ENGINEERING PROGRESS REPORTS	PRODUCTION PROGRESS REPORTS	
TESTING	DOT&E PROCEDURES DOT&E REPORT	IOT&E PROCEDURES IOT&E REPORT	FIRST ARTICLE TEST PROCEDURES FIRST ARTICLE TEST REPORT	FOT&E PROCEDURES FOT&E REPORTS
DESIGN/PERFORMANCE	DESIGN/PERFORMANCE SPECIFICATION – PRELIMINARY LEVEL 1/2 ENGINEERING DRAWINGS	DESIGN/PERFORMANCE SPECIFICATION – FINAL LEVEL 2/3 ENGINEERING DRAWINGS STANDARDS TECHNICAL MANUAL-PRELIMINARY	DESIGN CHANGE NOTICES/ TECHNICAL INSTRUCTIONS DESIGN CHANGE NOTICES/ TECHNICAL INSTRUCTIONS STANDARDS SL-3 COMPONENTS LIST → SL-4 PARTS LIST → TECHNICAL MANUAL-FINAL	DESIGN CHANGE NOTICES/ TECHNICAL INSTRUCTIONS DESIGN CHANGE NOTICES/ TECHNICAL INSTRUCTIONS STANDARDS → → DESIGN CHANGE NOTICES/ TECHNICAL INSTRUCTIONS
RELIABILITY AND MAINTAINABILITY	R&M PLAN-PRELIMINARY	MAINTENANCE ENGINEERING ANALYSIS	R&M PLAN-FINAL → REBUILD STANDARD/SL-6 APPLICATIONS LIST →	→ →
CATALOGING			ITEM IDENTIFICATION → SCREENING/CATALOGING DATA → – PROCUREMENT METHOD CODES (PMCs) → – MANAGEMENT DATA LIST (MDL)	→ → →
PROVISIONING			PROVISIONING LISTS → – SPTD (LONG FORM) – TTEL (LONG FORM) – CBIL (LONG FORM) – LLIL (LONG FORM) – PPL (LONG FORM) – SFPPL	→
QUALITY ASSURANCE	QA PLAN-PRELIMINARY		QA PLAN-FINAL ENGINEERING CHANGE PROPOSALS (ECPs)	QUALITY DEFICIENCY REPORTS (QDRs)
CONFIGURATION MANAGEMENT	CM PLAN-PRELIMINARY		CM PLAN-FINAL INTEGRATED CONFIGURATION LIST (ICL) → SERIAL NO. CONFIGURATION LIST (SNCL) → STATUS ACCOUNTING RECORDS →	ECPs MODIFICATION INSTRUCTIONS (MIs) TECHNICAL INSTRUCTIONS (TIs) LUBRICATION INSTRUCTIONS (LIs)
	CONCEPTUAL DEVELOPMENT	FULL-SCALE DEVELOPMENT	PRODUCTION/PROCUREMENT	DEPLOYMENT/OPERATION

Figure 5-3. Data Requirements Schedule

ELEMENT	CONTRACTOR AND CONTRACT NO.	CDRL ITEM NUMBER AND NOMENCLATURE	PRELIMINARY DELIVERY		PRELIMINARY REVIEW			FINAL DELIVERY		FINAL REVIEW			REMARKS
			SCHED	ACTUAL	MGT	TECH	FIN	SCHED	ACTUAL	MGT	TECH	FIN	

Figure 5-4. FLS Ordered Data Status Chart

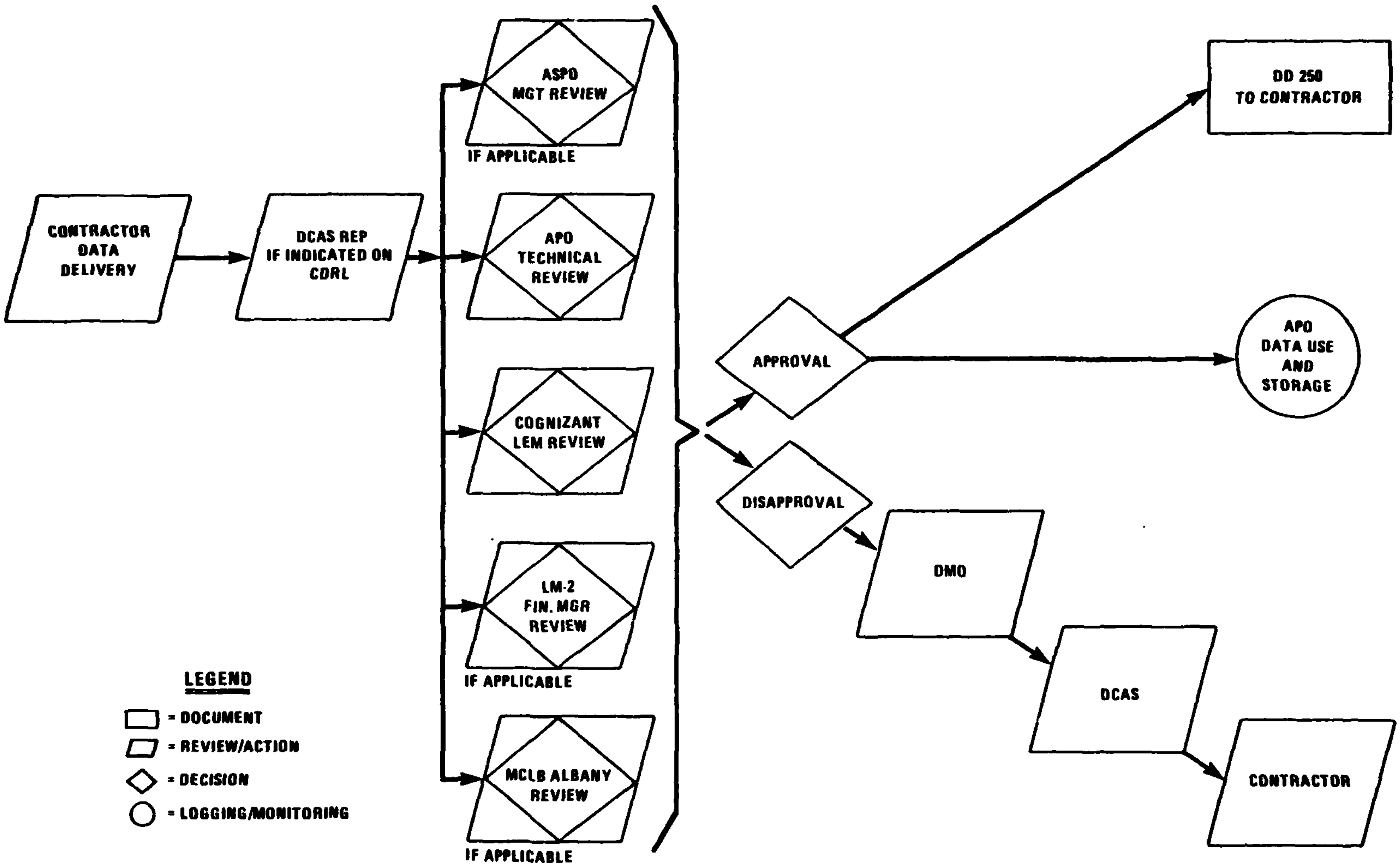


Figure 5-5. FLS Delivered Data Review and Management

REPORT DATE:

FLS ELEMENT NO. ______ NOMENCLATURE: ______

I NCTION	DATA ITEM	DID/TAILORED (Y/N)	DOCUMENT ID; TITLE	STORAGE SITE	POINT OF CONTACT

Figure 5-6. Technical Documentation Record

storage location; and names and telephone numbers of the document control personnel. The ASPO originates this record upon the element's approval for program initiation by identifying the data items required to support the end item, using the functional category as the controlling data element. The ASPO updates the record as frequently as necessary to maintain current supporting technical data on that element. The ASPO transfers the recordkeeping responsibility to the APO following Milestone III.

5.6.1 Defense Documentation Center (DDC)

The DDC has been established to serve as the record repository for ongoing DOD programs. Code LM-2 will make full use of DDC by maintaining a program data repository there. This repository will provide an FLS program data backup file, bulk reproduction capability, and retrieval capability for all FLS studies. Retrieval of DDC holdings may be accomplished on DD Form 55 which is available from DDC.

5.6.2 Data Repositories

FLS data storage sites are generally the same as those used by the Marine Corps at large. Their locations are determined by the types of data to be stored, Table 5-1 notes, by data type, the location and means of access of the FLS data banks.

Table 5-1. FLS Data Repositories

Type of Technical Data	Storage Site	Access Code
Engineering progress reports	DPO/ASPO/APO files	SSIC/Subject
DOT&E procedures/reports	MCOTEA	SSIC/Subject
Design/performance specifications (MC)	MCLB, Albany (P840)	Spec. No.
Engineering drawings (MC)	MCLB, Albany (P840)	Drawing No./Data List
Master repair parts lists (SL-4)	MCLB, Albany (P840)	Prefix Control No. (PCN)
Master components lists (SL-3)	MCLB, Albany (P840)	PCN
Technical Manuals	HQSP-2/MCLB, Albany (P840)	PCN
IOT&E procedures/reports	MCOTEA	SSIC/Subject
Maintenance records	LMA-1	NSN
Illustrations	MCLB, Albany (P840)	NSN
Rebuild Standards	MCLB, Albany (P840)	Std. No.
Maintenance engineering analysis	DPO/ASPO/APO files	SSIC/Subject
Item identification data	Defense Logistics Service Center (DLSC)	NSN
CM Plan/lists	DPO/ASPO/APO files	SSIC/Subject
Procurement/Support Codes	DLSC	NSN
Common & Bulk Items lists	MCLB, Albany (P830)	NSN
Long Lead Time Items lists	MCLB, Albany (P830)	NSN
Provisioning Parts lists	MCLB, Albany (P830)	NSN
Tools & Test Equipment lists	MCLB, Albany (P830)	NSN
Short Form Prov. Parts lists	MCLB, Albany (P830)	NSN

Table 5-1. FLS Data Repositories—Continued

Type of Technical Data	Storage Site	Access Code
Engineering Change Proposals (ECPs)	LMA-1/CCB	ECP No./NSN No.
Quality Deficiency Reports (QDRs)	LMA-1	QDR No./NSN
Modification Instructions (MIs)	LMA-1	MI No./NSN
Technical Instructions (TIs)	LMA-1	TI No./NSN
Lubrication Instructions (LIs)	LMA-1	LI No./NSN
Supply Instructions (SIs)	LMA-1	LI No./NSN
Management Data list (MDL)	MCLB, Albany (P830)	NSN
Application lists (SLs-6)	MCLB, Albany (P840)	NSN

CHAPTER 6

CONFIGURATION MANAGEMENT

6.1 INTRODUCTION

This chapter delineates the concept, parameters, and techniques for product identification and configuration control of the functional and physical characteristics of all elements within the FLS. This includes the procedures for the establishment of functional/physical baselines during the advanced development phase of the acquisition program, an outline of criteria for establishment of functional, allocated, and product baselines, and a definition of procedures for the introduction of designated configuration items (CIs) into a Configuration Control Board (CCB) review. Control of changes in accordance with these procedures during the research and development (R&D) phase of baseline determination will establish the optimum FLS configuration and should minimize the need for costly production or postproduction changes.

6.2 MANAGEMENT

6.2.1 General

The objectives of FLS configuration management (CM) are to provide guidance preparatory to control of system and equipment configuration; to define the functional, allocated, and product baselines; to establish configuration control measures to maintain these baselines; and to provide formal uniform procedures for efficiently changing the baselines if determined to be in the best interest of the Marine Corps.

6.2.2 FLS Configuration Management

The Head, Concepts and Requirements Office (C&RO), within the Materiel Division, HQMC, acting for the acquisition sponsor in executing the FLS, must ensure that CM is properly implemented. Accordingly, personnel within the C&RO and FLS-related APOs will implement the provisions of MCO 4130.1A, as specified herein.

6.2.2.1 ASPO Responsibility. Cognizant ASPOs are designated as configuration managers for their respective commodities and are responsible for overall management of the CIs within their programs. Specific tasks for which management responsibilities are to be exercised include identification, control, accounting, and auditing the functional and

physical characteristics of each FLS element. Management responsibilities are set forth in MCO 4130.1A, appendix D. Directed actions include:

- Establishing and implementing CM planning, guidance, task definition, and scheduling.
- Defining detailed CCB procedures, initiating action to effect designation of CCB members, and activating a formal CCB.

6.2.2.2 APO Responsibility. Each FLS APO will ensure that all CM tasks are accomplished in a timely and efficient manner on appropriate CIs.

6.2.2.3 DPO Responsibility. Each FLS DPO is responsible for managing changes to the item's configuration during the development phase. This responsibility will be transferred to the APO during the production phase.

6.2.2.4 CCB Chairperson. The cognizant ASPO for each FLS commodity is designated as CCB chairperson. The alternate is the APO.

6.2.2.5 CCB Secretariat. A CCB secretariat will be designated within each FLS subsystem. Each secretariat will be responsible for administrative action relative to all matters concerning CCB reviews. These administrative functions are to be conducted in concert with ASPO and APO responsibilities for CM of FLS elements under their cognizance and are to include coordination of review actions between CCB participants.

Specifically, the following actions are to be implemented:

- Receive, establish control records, and distribute engineering change proposals (ECPs) to interested activities for review and recommendations.
- Schedule CCB meetings.
- Record and issue reports of CCB meetings.
- Maintain a current listing of CCB members and alternates.

6.2.2.6 Cognizance and Organization of CCBs. Cognizance and composition of the FLS CCBs are as follows:

a. Cognizance of CCBs. Each proposed Class 1 engineering change (as defined by DOD-STD-480) to a deliverable CI or one that has been delivered for service use, must be reviewed and approved by an officially designated FLS CCB.

b. Composition of CCBs. FLS CCBs consist of:

(1) Chairperson

(2) Voting Members

- Chairperson
- Responsible logistic element managers (LEMs)
- Principal development activity (PDA), as assigned
- Remaining ACG members

(3) Associate Members (nonvoting)

Representing (as appropriate):

- CM
- Contracting office
- Safety/human engineering
- Engineering (design, test, and development)
- Supply support

6.3 PROGRAM REQUIREMENTS

6.3.1 General

All FLS elements designated as CIs are to be subjected to configuration control in accordance with the MCO 4130.1A. The effects of changes authorized for CIs, on specifications and related technical data, are to be reflected in these data.

6.3.2 Contractor Requirements

FLS item contractors are required to submit CM plans in accordance with the Contract Data Requirements List (CDRL) (DI-E-2035) and to designate CM coordinators. The CM coordinator is to interface functionally with the cognizant APO who will serve as the particular FLS point of contact. Each FLS item contractor is responsible for developing CM programs in accordance with the stated contractual provisions for configuration identification, control status accounting, and audit. These provisions will, in all cases, provide for the following:

- Development of detailed configuration identification, to include design disclosure documentation for each CI as specified in section 6.4 herein.
- Establishment of configuration control review and approval procedures for ECPs at the contractor level.
- Initiation and proposal of engineering changes considered necessary and feasible by the contractor and as requested by the contracting officer.
- Establishment of configuration status accounting for each CI produced.

Configuration status accounting requirements are essential to identify the initial configuration of an item and to determine the status of proposed and approved changes for implementation action. Contractors must maintain uniform, orderly procedures of data management for configuration identification and control, in accordance with the CDRL, to describe the system/equipment configuration at all times during their respective contract periods. Contractor master status records will be maintained to support the configuration requirements of this plan and must be compatible with section 6.5.4 herein.

6.4 CONFIGURATION IDENTIFICATION

6.4.1 General

Configuration identification is defined in MCO 4130.1A as the approved technical documentation for a CI contained in pertinent specifications, drawings and associated lists, and documents. Three configuration identification categories which the APO must establish are:

a. Functional Configuration Identification (FCI)/Functional Baseline.

b. Allocated Configuration Identification (ACI)/Allocated Baseline.

c. Product Configuration Identification (PCI)/Product Baseline.

6.4.2 CI Development

CIs are developed by an approved and recorded technical description of a system, equipment, or item designated to be configuration managed. This description is the basis for configuration control and configuration status accounting. A record of configuration identification documentation will be maintained throughout the life cycle of a CI, starting with the initial configuration and continuing with subsequent configurations resulting from incorporation of approved changes.

6.4.3 CI Development Record

CI development records will provide status information on the development progress of configuration items and will be reflected in specification audits and reviews. The CI development record for each new design CI will be assembled and maintained in a log and will record significant program actions. The log is to be prepared by the integrating or systems engineering contractor as designated by the procuring activity. Distribution of a contractor-prepared log will be specified in the CDRL (DI-E-2035). The initial issue of the log will include a record of all specifications for items of new design which are part of the functional or allocated baseline. As requirements for additional new design items are established, a record must be added for each specification. Each CI development record is to contain information which may be included in configuration status accounting records. Development records are to be prepared in the format shown in figure 6-1. Scheduled activity that is accomplished is annotated with a "C" after the date. Impact of changes on related CIs are recorded in the format shown in figure 6-2. Whenever a change to the CI has an impact on related CIs, the following information is listed:

- The specification or document title and identification number of the affected CI.
- The Specification Change Notice (SCN) and ECP covering the changes to the affected item.
- The contractor responsible for the related CI.

NOMENCLATURE	
DEVELOPMENT SPECIFICATION NUMBER AND DATE AUTHENTICATION DATE	
CONFIGURATION ITEM IDENTIFICATION	
CONFIGURATION ITEM PART NUMBER	
PRELIMINARY DESIGN REVIEW SCHEDULED DATE:	CRITICAL DESIGN REVIEW SCHEDULED DATE:
FUNCTIONAL CONFIGURATION AUDIT - SCHEDULED DATE:	PRODUCT SPECIFICATION SCHEDULED SUBMITTAL DATE:
PHYSICAL CONFIGURATION AUDIT - SCHEDULED DATE:	
CI QUALIFICATION SCHEDULED DATE:	
PRODUCT SPECIFICATION SCHEDULED AUTHENTICATION DATE:	
CI FORMAL QUALIFICATION CERTIFICATION DATE:	
QUALIFICATION TEST REPORT	
CONTRACTOR	CONTRACT NO.

Figure 6-1. CI Development Record—Part I

NOMENCLATURE OF CI					
CI SPECIFICATION NUMBER AND DATE					
CI SPECIFICATION		IMPACT OF CHANGES ON RELATED CONFIGURATION ITEMS			
SCN	ECP	SPECIFICATION/DOCUMENT TITLE AND NUMBER	SCN	ECP	CONTR
CONTRACTOR			CONTRACT NO.		

Figure 6–2. CI Development Record—Part II

6.5 CONFIGURATION CONTROL

6.5.1 General

The approved baseline documentation and CIs discussed in section 6.4 will be changed only as a result of approval of an ECP, request for deviation, or request for waiver. The configuration identification and its control is maintained by the APO for the configuration manager. Engineering changes to the established baselines will be processed in accordance with section 6.5.3. The ECP flow process for FLS items is shown in figure 6-3.

6.5.1.1 Change Evaluation Criteria. The change classification and approval level will be determined by the hardware and documentation affected by the change. Acceptable criteria and approval level will be determined by the APO. All ECPs will address the major unit level, even though the change applies to a lower level of design indenture. The evaluation of each proposal will consider all aspects of the change on the CI provided on the Change Proposal Evaluation Log, figure 6-4.

6.5.2 Classification of Changes

6.5.2.1 ECPs. Each ECP is prepared in conformance with the CDRL (DI-E-4527A) and is assigned an appropriate classification by its originator. A single ECP will suffice to describe a change which might affect the varied elements of a system, such as hardware, specifications, procurement drawings, control drawings, test, support, and associated data (including training materials).

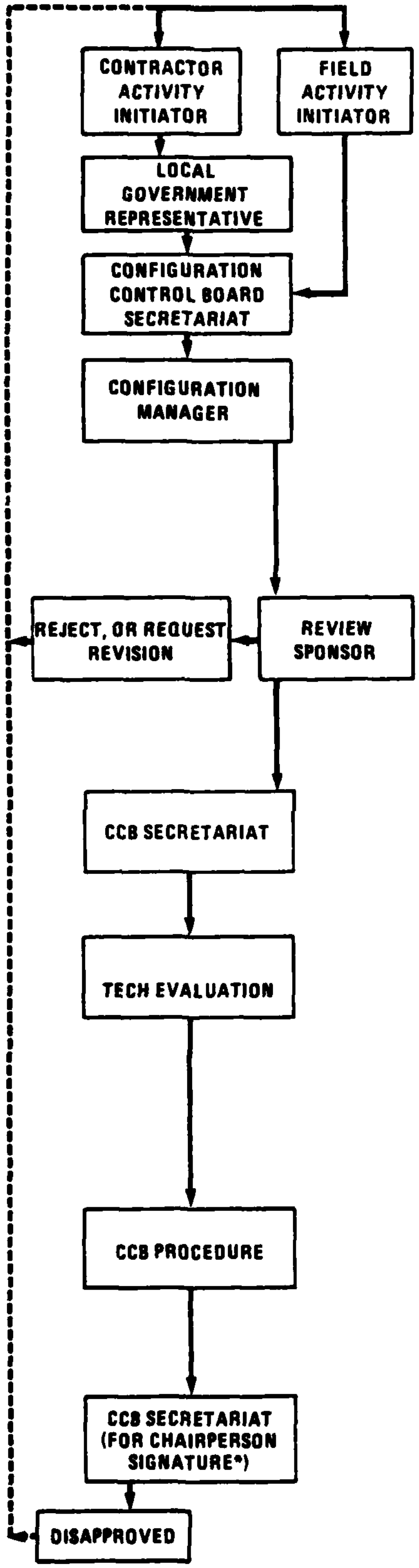
6.5.2.2 Class I Changes. DOD-STD-480 provides explicit directions for determination and designation of Class I ECPs. These classification requirements are to be strictly followed by originators of ECPs for FLS application.

6.5.2.3 Class II Changes. DOD-STD-480 requires that engineering changes are to be classified Class II when they do not fall within the definition of Class I changes and it provides examples of such conditions. This requirement will be followed for FLS items.

6.5.2.4 Deviations. A request for departure from a particular FLS item performance or design requirement of a specification, drawing, or other document, must be submitted and processed as a deviation in accordance with DOD-STD- 480/MIL-STD-481.

6.5.2.5 Waivers. A request for approval of a nonconforming item which is found to depart from specified requirements during or after manufacture must be submitted and processed as a waiver in accordance with DOD-STD-480/MIL-STD-481. Each waiver will include a certification by the originator, together with supporting evidence that the nonconforming item is suitable for use "as is" or will be acceptable after rework by an approved method.

6.5.2.6 Priority Determination. ECP priority assignments of emergency, urgent, and routine are to conform with DOD-STD-480.



STEP 1
- PREPARE ECP
- PROVIDE COST DATA
- CONDUCT INITIATOR REVIEW

STEP 2
- VERIFY CONTRACTOR REVIEW
- VERIFY CLASSIFICATION

STEP 3
- RECORD RECEIPT OF ECP
- REVIEW FOR COMPLETENESS
- PREPARE PROPOSED DISTRIBUTION LIST

STEP 4
- INDICATE ASSIGNMENT OF REVIEW SPONSOR (COG ACG MEMBER)
- REVIEW ECP FOR COMPLETENESS AND ADEQUACY
- VALIDATE PRIORITY
- IDENTIFY INTERFACE
- VERIFY EVALUATION DISTRIBUTION LIST

STEP 5
- MAKE DECISION REGARDING NEED FOR ECP
- PREPARE (FOR CONFIGURATION MANAGER SIGNATURE):
  (1) REJECT LETTER
  (2) REVISION REQUEST LETTER
  (3) DECISION TO PROCESS MEMO.

STEP 6
- ASSIGN CCB NUMBER
- DISTRIBUTE ECP ON EVALUATION LOG FOR TECH EVAL
- SCHEDULE CCB

STEP 7
- PERFORM TECH EVAL AND PROVIDE REVIEW SPONSOR DETAILED COMMENTS ON AREA OF COGNIZANCE:
  A. ENGINEERING AND DESIGN
  B. ILS
  C. INSTALLATION
  D. INTERFACE
  E. CONFIGURATION MANAGEMENT
  F. PROGRAM PLANS, COST AND SCHEDULE

STEP 8
- REVIEW SPONSOR PRESENTS PROPOSED CHANGE
- BOARD MEMBERS AND TECHNICAL WITNESSES TESTIFY
- CHAIRPERSON CALLS FOR VOTE
- CHAIRPERSON RENDERS DECISION
- SECRETARIAT MAINTAINS MINUTES

STEP 9
- REVIEW SPONSOR PREPARES DISAPPROVAL LETTER OR IMPLEMENTATION (HMR/CCBD) AS APPLICABLE*
- SECRETARIAT ISSUES REPORT

Figure 6-3. HQMC ECP Evaluation Flow Chart and CCB Procedures

CHANGE PROPOSAL EVALUATION LOG

1. SUBJECT: (NSN/ITEMS NAME) ________________ CLASSIFICATION ________

2. ECP NO. ________________ HMR/CCBD NO. ________________

3. CCB SECRETARIAT RELEASE TO REVIEW SPONSOR/DATE/ ________________

4. ASSIGNED REVIEW SPONSOR ________________ RESPONSE REQ'D BY/DATE/ ________________

5. ROUTING FOR EVALUATION
(REVIEW SPONOR INSERT ROUTING CODES FROM CHAPTER 3 OF HQ04105.1)

CODE	AFFECTED NO	AFFECTED YES	CODE INITIAL	DATE	RECOMMENDATION/ COMMENTS (ATTACH SHEET IF MORE SPACE NEEDED)

6. REVIEW SPONSOR'S ANALYSIS

a. NATURE OF CHANGE	NO	YES
CORRECTION OF DEFICIENCY (GOVERNMENT OR CONTRACTOR RESPONSIBILITY)	____	____
SAFETY	____	____
COMPATIBILITY	____	____
INTERFACE	____	____
COST REDUCTION	____	____
VALUE ENGINEERING	____	____
PRODUCTION STOPPAGE	____	____
RECORD ONLY	____	____
________________		
b. ITEMS IMPACTED		
SPEC/MANUALS/HANDBOOKS/DWGS/1423	____	____
TEST PROGRAM	____	____
TRAINING PROGRAM	____	____
DELIVERY SCHEDULE	____	____
PROVISIONING	____	____
SUPPORT AND TEST EQUIPMENT	____	____
TRANSPORTATION AND HANDLING	____	____
PRESERVATION, PACKAGING, AND PACKING	____	____

(CLASSIFICATION ____)

Figure 6-4. Change Proposal Evaluation Log (Sheet 1 of 2)

CHANGE PROPOSAL EVALUATION LOG (CONTINUED) HMR/CCBO NO. ____________

c. WHAT ALTERNATIVE SOLUTIONS WERE CONSIDERED? ____________

d. WHAT EFFECT WOULD DISAPPROVAL HAVE? ____________

e. WAS LIAISON PERFORMED WITH DESIGN ACTIVITY TECHNICAL PERSONNEL?
IF YES, NAME OF CONTACT ____________

f. IMPACT ANALYSIS

	COST IMPACT			SCHEDULE IMPACT	
	NO COST	DECREASE	INCREASE	NO	YES
DESIGN	( )	( )	( )	( )	( )
CONSTRUCTION	( )	( )	( )	( )	( )
TEST	( )	( )	( )	( )	( )
PROVISIONING	( )	( )	( )	( )	( )
SOFTWARE	( )	( )	( )	( )	( )
7. SPONSOR'S RECOMMENDATION	( )	( )	( )	( )	( )

( ) APPROVE ( ) DISAPPROVED ( ) OTHER (SPECIFY)

REVIEW SPONSOR'S SIGNATURE ____________ DATE ____________

8. CCB DECISION

CODE	CCB MEMBER	DATE	DISAPPROVE	APPROVED
	CHAIRPERSON			

PRIORITY: URGENT ____________
ROUTINE ____________

REMARKS FOR THE RECORD

(CLASSIFICATION ______)

FORM 4-2B

Figure 6-4. Change Proposal Evaluation Log (Sheet 2 of 2)

- The assignment of "emergency" is made to proposed changes to correct a hazardous condition which may result in fatal or serious injury to personnel or extensive damage or destruction to equipment.
- A change which corrects a potentially hazardous condition or safety problem, or prevents schedule slippage, is an "urgent" requirement for the originator and will be so identified for assignment (as a priority approved action) by the CCB secretariat.
- All other proposed changes are "routine" for processing purposes unless a higher priority with an effectiveness date is assigned by the configuration manager.

6.5.3 ECP Processing

The procedures for ECP processing are shown in figure 6-3, and described as follows:

6.5.3.1 Contractor Originated ECPs

- Initial Submission. FLS item contractors prepare and process preliminary ECPs for formal review in accordance with DOD-STD-480/MIL-STD-481. Class I ECPs are forwarded via the Administrative Contracting Officer (ACO) to the CCB secretariat with certification that the contractor's CCB review group has conducted a formal review prior to its submittal. Class II ECPs are reviewed by the ACO for concurrence in classification prior to their release within the contractor's plant.
- Preliminary Review. The configuration manager reviews the preliminary ECP for completeness and classification. The ECP will be returned to the contractor for revision and resubmission if it is incomplete.
- CCB Review. The CCB secretariat distributes ECPs received for evaluation and action and schedules meetings in accordance with this plan (figure 6-3). The Change Proposal Evaluation Log (figure 6-4) is completed and signed by all voting members to record formal CCB action. When an ECP is approved, instructions and funding authorizations are issued as part of the approval action in accordance with paragraph 6.5.3.3.

6.5.3.2 Government-Originated ECPs. All proposed engineering changes originated by government activities, regardless of source, must be processed through the CCB secretariat to the FLS item contractor for evaluation and recommendation. The contractor's response will be returned to the APO, who will determine whether an ECP should be developed. ECPs generated for official submittal must conform to DOD-STD-480. The APO may require the contractor to conduct a technical review of the Class I ECPs in order to determine the feasibility and suitability of the change. A request for a formal ECP review by a contractor must be forwarded in accordance with contract provisions with an established funding limitation specified. All resulting ECPs are processed, as outlined in section 6.5.3, for CCB secretariat, APO, and CCB action as necessary.

6.5.3.3 Change Implementation. Approved engineering changes are implemented as soon as practicable and in a cost-effective manner. The Headquarters Modification Requisi-

tion/Configuration Control Board Directive, figure 6–5, will be followed for change implementation. The APO will schedule the design change, hardware modification, and retrofit for affected CIs, dependent upon the system/equipment status, i.e., production, in-transit, storage, or final installation. The APO will determine the implementation procedures for each approved change in accordance with pertinent contract provisions. The CI contractor must schedule, monitor, and maintain a status record file for the implementation of approved changes.

6.5.4 Processing Requests for Deviations and Waivers

CI contractors will be expected to comply with the approved CI and product baseline, except when a specific deviation or waiver is authorized. Requests for deviation and waiver are to be prepared on DD Form 1694 and are classified in accordance with DOD–STD– 480. Contractors are to submit all requests for deviation and waiver to the ACO for review and determination. When an engineering change will result or the parts breakdown list (PBL) will be affected, the ACO will request the affected contractor to submit an ECP. When a request for engineering deviation or waiver is classified as major or critical, the ACO will request the contractor to submit a Class I ECP and will endorse the completed DD Form 1694 with appropriate recommendations to the APO. The ACO will review all requests to determine whether a contract modification is required. Requests affecting cost and schedule must be endorsed to the APO with appropriate recommendations. In this regard, the ACO is responsible for ensuring the quality assurance (QA) review of all requests for waiver involving nonconformance with specifications and design and for inclusion of the QA findings with the endorsement. The ACO will also furnish copies of requests involving engineering disciplines and potential design impact to the APOs for review and evaluation.

The ACO reviews each request for deviation and waiver to determine that:

- The information is complete and sufficient for defining the proposed nonconformance.
- The appropriate designation as critical, major, or minor is furnished.
- The request qualifies as an ECP.

The ACO action on all requests is executed by the individual holding contractual authority. The ACO will endorse all requests to the APO and maintain records of the approval/disapproval disposition for inspection and ultimate acceptance of the end product.

6.5.5 Installation and Interface Control

The APO is responsible for establishing and maintaining uniform installation and interface controls. This requires that contractors review proposed changes to determine if interfaces are impacted by these changes and to ensure that such impacts are identified as "critical," when appropriate. The APO will consider all design, performance, and installation interfaces and determine whether the "critical" designations are, in fact, essential.

HEADQUARTERS MODIFICATION REQUISITION/CONFIGURATION
CONTROL BOARD DIRECTIVE

PART ONE (LM)	1. CLASSIFICATION:
2. FROM: DIRECTOR MATERIAL DIVISION (LM) TO: DIRECTOR, CONTRACTS DIVISION (LBC)	3. FILE NO: 4. DATE:
5. A. SUBJ: (NSN/ITEM NAME) B. ENCL: (1) ( ) TECHNICAL CHANGE ATTACHMENT SHEET	6. A. ACQUISITION PROJECT OFFICER B. REF: PWO NO. ______ HCA NO. ______ C. PRIORITY: ( ) EMERGENCY ( ) URGENT ( ) ROUTINE D. CONTRACTOR/MC ACTIVITY
7. REFERENCE: (REQUEST FOR ECP)	

8. IT IS REQUESTED THAT THE APPROPRIATE PORTIONS OF THE ABOVE-CITED PROCUREMENT DOCUMENT BE MODIFIED AS SPECIFIED HEREIN.
   A. THE ITEM AS DESCRIBED HEREIN IS TO BE PROCURED
      ( ) ONE TIME ( ) REPETITIVELY
   B. NATURE OF CHANGE (1)______ (2) ______
   C. THE FOLLOWING REQUIRE REVISION AS A RESULT OF CHANGED REQUIREMENTS: (CHECK)
      ( ) SPECIFICATION NO.______ ( ) DELIVERY SCHEDULE ______
      ( ) PURCHASE DESCRIPTION NO. ______
      ( ) OTHER (SPECIFY, SUCH AS "WORK STATEMENT"); (GFE) ______
      ( ) CHANGE TO ASSOCIATED EQUIPMENT, INCLUDING SUPPORT EQUIPMENT, SPARES AND SOFTWARE

9. TYPE & NO. OF TECHNICAL DIRECTIVE	10. CHANGE STATUS: A. ( ) PRODUCTION ______ B. ( ) RETROFIT ______ CATEGORY ______

11. PROPOSED ACTION:
   A. ( ) AMEND SPEC
   B. ( ) REQUIRED DATA FOR APPROVAL
   C. ( ) CONDUCT TEST
   D. ( ) TECHNICAL DIRECTIVES PREPARED BY ______
      ( ) MANUALS
      ( ) DRAWINGS
   E. ( ) UPDATE TRAINING BY ______
   F. ( ) DELIVERY SCHEDULE
      ( ) AFFECTED
   G. ( ) SUPPORT EQUIPMENT
   H. ( ) PROVISIONING
   I. ( ) AMEND 1423

12. PRICE INFORMATION AND FUNDING:
   THIS CHANGE WILL AFFECT THE CONTRACT PRICE AS FOLLOWS:
   ( ) NO CHANGE
   ( ) TECHNICAL ESTIMATED MINIMUM DECREASE
   ( ) COST INFORMATION & FUNDING SUPPLEMENT ATTACHED
   ( ) *TECHNICAL ESTIMATE NOT TO EXCEED ______

   *THE TECHNICAL ESTIMATE CITED ABOVE SHALL NOT BE EXCEEDED WITHOUT LM APPROVAL.

13. DESCRIPTION OF CHANGE: (COMMENTS)

14A. PREPARED/DATE	14B. CURRENT/DATE	14C. APPROVAL/DATE

(CLASSIFICATION ______)

Figure 6-5. Headquarters Modification Requisition/Configuration Control Board Directive

Control Board Directive Proposed changes submitted by user activities will be analyzed and evaluated for installation and interface control criticality and essentiality. When an ECP affects an interface control document, the change authorization will include instructions to the APO for establishing the revised control baseline and for monitoring its implementation.

When an ECP is approved and translated into a modification instruction (MI), the Marine Corps Integrated Maintenance Management System (MIMMS), defined in MCO P4790.1, will track the accomplishment of the MI, if it applies to a serialized item. The MIMMS information system provides two configuration status accounting reports for MIs. The reports are titled:

- Modification Status (issued monthly).
- Modification Application Status (issued on an as-required basis).

6.6 CONFIGURATION STATUS ACCOUNTING

6.6.1 Configuration Status Accounting Records Files

Configuration status accounting (CSA) information and data shall be maintained by each contractor and by the configuration manager. The CSA will support the configuration identification and control requirements specified in sections 6.4 and 6.5 of this plan. Data elements utilized are defined in MIL-STD-482A. Supplemental data elements will be submitted for approval in accordance with section 1.2 of MIL-STD-482A. In order to accommodate the range of data required and account for the FLS CI inventory in the most economical manner possible, a CSA system consisting of two subsystems will be employed.

6.6.1.1 Standard CSA Subsystem. This subsystem accounts for the configuration of serialized components, support equipment, etc., and their physical location (figure 6-6). It indicates the serial number of an item on which a selected component is installed and provides for a continual matching of the configuration of each item against the applicable unincorporated modification. This information facilitates command decisions in the following areas:

- CI assignment (to introduce, rebuild, transfer, etc.).
- Status of compliance with MIs.
- Workload projections by man-hours required for MI compliance.
- Procurement and positioning of modification kits/materials.
- Approval of additional modifications, including the priority established for their incorporation and the extent of their interface between other approved but unincorporated MIs.

6.6.1.2 Bulk Accounting CSA Subsystem. This subsystem provides a summary of CSA data for the items that are subject to configuration changes but do not require accounting to the extent of the other elements. This system indicates on a single line report (figure 6-7)

A ITEM DESIGNATOR (ID NO.)	B NOMENCLATURE (ALPHANUMERIC DESCRIPTOR)	C PART NO. P/N	D NATIONAL STOCK NO. (NSN)	E MFG. CODE	F COMPONENT SERIAL NO.	G CI USING UNIT (REPORTING)	H ID IN WHICH COMPONENT IS INSTALLED	I FIELDED/READINESS OWNER/USING UNIT (REPORTING)	J MI/TI NUMBER	K KIT NSN	L CHANGE PRIORITY	M MAN. HOURS REQD. (M/HRS.)	N COMPLIANCE STATUS		O IDs REQUIRING INTERFACE
													NO	YES	

Figure 6–6. Standard Accounting Modification Instruction (MI) Incorporated Status

A ID NO.	B NOMENCLATURE	C PART NO.	D DASH P/N		E MFG. CODE	F NSN	G CONTRACT NO.	H QTY. PROC.	I MI/TI BASIC PT.	J KIT NSN	K TOTAL AUTH. QUANTITY	L TOTAL INC. QUANTITY	M TOTAL NON-INC. QUANTITY
			OLD	NEW									

Figure 6–7. Bulk Accounting Modification Instruction (MI) Incorporated Status

the total applicability and the current status (incorporated/not incorporated) for each MI application to each CI entered into this subsystem. This is a more economical subsystem and is used where that depth of data will satisfy management requirements. Strict compliance with identification and re-identification requirements is mandatory for bulk accounting.

6.6.1.3 <u>CSA Implementation</u>. The implementation of a CSA system requires a standard format for reporting and recording. The format is based on baseline listings with standard data elements in accordance with MIL-STD-482A. Acquisition of the baseline data is by CDRL (DI-E-2039). MIMMS ID standards data file changes are reported in accordance with MCO 4790.7 and SASSY Quarterly Using Unit Modification Reports in accordance with MCO 4790.5A. All are incorporated by the CSA management activity. Baseline records for existing inservice equipment are generated on a selected basis by commodity managers.

6.6.1.4 <u>Recording of Baseline Information</u>. Specific management points for the technical maintenance of baseline data and changes will be established. Management of baseline information is a two-phase process.

> <u>Phase I</u>. The ASPO is responsible for establishing the CM plan for his designated project within the guidelines of this chapter. The baseline information will be managed by the DPO in accordance with this chapter during the development phase. This responsibility will be transferred to the APO during the production phase.
>
> <u>Phase II</u>. Cognizant Inventory Control Points are designated as CM activities as early as possible in the life cycle of each CI.

6.6.2 <u>Summary Listing of ECP Projects and Recording of Approved Changes</u>

Upon establishment of a product baseline for a CI, all requested, proposed, and authorized changes to that baseline will be listed and submitted on a summary of ECP projects in accordance with the CDRL (DI-E-21351). Inclusion of all baseline items in the summary is required. A valid summary listing of ECP projects must be maintained throughout the life cycle of the CIs.

6.7 CONFIGURATION AUDITS

6.7.1 <u>Functional Configuration Audits</u>

A functional configuration audit is the formal examination of the functional characteristics' test data prior to acceptance of the item. The audit will verify the item's achievement of performance specified in its functional or allocated configuration identification.

The contractor prepares a functional configuration audit plan in accordance with the CDRL (DI-E-2036) and conducts the audit as approved by the ACO. It is recognized that many of the tests and functional demonstrations necessary to achieve the goal of a functional configuration audit occur during development or qualification testing; therefore, the

contractor may include such tests and demonstrations in his plan so that, in fact, the audit is conducted incrementally.

6.7.2 Physical Configuration Audits

A physical configuration audit is the formal comparison of the "as-built" configuration of an item with its technical documentation prior to its acceptance. This is accomplished in order to establish the item's initial product configuration identification.

The contractor prepares a physical configuration audit plan in accordance with the CDRL (DI-E-2036) and conducts the audit as approved by the ACO. The contractor then may schedule physical configuration audits of individual units of the total system, or equivalent, to be conducted over a reasonable period of time.

CHAPTER 7

INTEGRATED LOGISTIC SUPPORT (ILS)

7.1 INTRODUCTION

This chapter describes the planning necessary for development and acquisition of required FLS support resources through implementation of the ILS process. Support planning must be an integral part of FLS system engineering and design to sustain the fielded item for its service life. Tradeoffs must be addressed continuously to optimize the balance among considerations relating to operational capabilities, interim and long-range support, scheduling, acquisition costs, and estimated life-cycle costs.

The basic objective of ILS planning for FLS is to promote the development and acquisition of hardware which reflects technical excellence, cost-effectiveness, reliability, maintainability, and supportability when delivered to the Fleet Marine Force (FMF). To meet these prerequisites, the ILS process requires a continuing dialogue throughout the acquisition cycle between acquisition project officers (APOs), development project officers (DPOs), HQMC logistic element managers, lead service logistic specialists, and equipment designers.

Support requirements must be reviewed repeatedly for their impact on design objectives, testing, scheduling, and operational performance. Based upon reliability and maintainability goals and projected support requirements, the detailed design and ILS prerequisites can be specifically defined in terms of assigned tasks and needs. These prerequisites are expressed in terms of equipment availability, utilization, downtime, repair turnaround time, operator requirements, maintenance man-hours per operating hour, and cost constraints as appropriate to the equipment type and its intended use.

7.2 FLS LOGISTIC SUPPORT PLANNING

One of the primary objectives of FLS logistic planning is to simplify equipment support requirements to the level consistent with equipment operational readiness requirements. This requires a systematic evaluation of the equipment design and its intended use by material support analysts. This process is applicable to all design and testing aspects including review of design changes to correct deficiencies or improve capabilities. As a function of engineering management, adequate logistic planning ensures that all integrated logistic support (ILS) elements are effectively managed, including the more subtle ones

which tend to be overlooked when design/testing difficulties are encountered. A full understanding of ILS is necessary to ensure the following:

- That equipment support program objectives are met.
- That practical, cost-effective methods for achieving equipment performance goals are fully exploited.
- That adequate assessment of alternative support concepts is completed.

The cost of planning, developing, acquiring, and managing ILS resources in an operational environment is an inherent part of overall life-cycle costing. Design characteristics must therefore consider logistic support resources which will be required versus those which are reasonably expected to be available in the environment where the equipment will be used. Tradeoffs between design characteristics and logistic considerations must then be made in order to maximize effectiveness and efficiency of support, while preserving the functional advantages offered by the equipment. Logistic planning during the FLS equipment acquisition process therefore must accomplish the following:

- Influence requirements and design, through support considerations.
- Define support requirements that are optimally related to the design and to each other.
- Acquire the required support.
- Provide the required support at minimum cost after the equipment is approved for service use.

7.3 LOGISTIC SUPPORT ANALYSIS (LSA)

The LSA is the key process through which logistic considerations can influence equipment design. Each design concept or design decision/change should be systematically analyzed by logistic support personnel for its impact on equipment support. Their examination should include such considerations as frequency of maintenance, man-hours and skill requirements, required facilities, spare parts, etc. The resulting analysis, along with logistic support impact descriptions, should then be fed back to equipment designers for their consideration. This iterative dialogue between logistic support and design personnel is an inherent part of equipment development. It identifies problems and forces decisions relative to design versus support tradeoffs before the equipment design is finalized. At best, the LSA will identify logistic support problems early enough to allow redesign before unsupportable equipment is fielded. At the very least, the LSA will provide for an accurate identification of logistic support resources required for effective equipment operation in a field environment.

The LSA also assists in the identification of significant life-cycle cost drivers so that equipment procurements can be managed and controlled in consonance with budget con-

straints. LSA updating should continue until each FLS element has reached design stability with LSA results reflected in appropriate ILS plans.

Over 50 analyses with direct bearing upon logistic support have been conducted on FLS equipment since the FLS integration process began. Included therein are the following:

- Economic Analysis of FLS Container Subsystem, July 1980.
- Analysis of Erection Requirements for the MCESS Unit Maintenance/Storage Shelter 20'X33', January 1980.
- Analysis of Erection Requirements for the MCESS Organizational Maintenance/Storage Shelter 32'X73', Configurations A and B, January 1980.
- Analysis of Erection Requirements for the MCESS Logistical Maintenance/Storage Shelter 60'X128', Configurations A and B, January 1980.
- Analysis of Quality Deficiencies in the MCESS Unit Maintenance/Storage Shelter 20'X33', February 1980.
- Analysis of Quality Deficiencies in the MCESS Organizational Maintenance Shelter, February 1980.
- Analysis of Flatrack Requirements for Transportability of MCESS Large Shelters, March 1980.
- Analysis of Training Requirements for MCESS Large Shelters, March 1980.
- Analysis of Requirements for Galvanized Steel in MCESS Large Shelters, May 1980.
- Analysis of FMF Manpower/Labor Requirements for Erection of MCESS Small Shelters, July 1980.
- Economic Analysis of M54/M813 Retrofit, December 1979.
- Analysis of FMF Electric Power Generator Requirements, October 1979.
- Analysis of FMF Air-Conditioning Requirements, October 1979.
- Analysis of the Merchant Ship Modular Suiting Concept, November 1979.
- Analysis of FMF Bridging Requirements, June 1980.
- Manpower and Training Requirements Analysis, December 1980.

Based on existing acquisition schedules for FLS equipment items, the following LSA-related efforts are either ongoing or scheduled to begin in the near future:

- Analysis of recent and planned force structure changes impacting on FLS equipment requirements.
- Analysis of FLS program development decisions impacting on FLS equipment requirements.
- Analysis of the status of existing equipment to be replaced by FLS equipment and resulting impact on phasein/phaseout plans.
- Analysis of optimum distribution of support equipment to complement introduction of FLS equipment.

- MGB Flotation Alternative Analysis.
- Analysis of U.S. Army ILS program development efforts incident to USMC requirements for the high mobility multipurpose wheeled vehicle (HMMWV).
- Analysis of the USMC operational requirement for a fuel-fired galley.
- Analysis of the USMC requirement for a marginal terrain vehicle to complement the planned tactical vehicle fleet.
- Analysis of outfitting requirements for MCESS rigid and EMI shelters.
- Analysis of USMC tactical motor transport requirements based on evolving Marine Corps force structure during the mid- and long-range periods.
- Analysis of development and operational testing results related to logistics vehicles.
- Analysis of procedures and support equipment requirements to array, handle, and maintain FLS containers.
- Analysis of stowage spare utilization incident to introduction of FLS containers.
- Analysis of transport and handling requirements for MCESS shelters.
- Analysis of first article testing results for large shelters.

7.4 ILS PLANNING ELEMENTS

DOD Directive 5000.39, dated 17 January, 1980, identifies nine ILS planning elements for consideration during the equipment acquisition cycle. These elements are portrayed in figure 7-1.

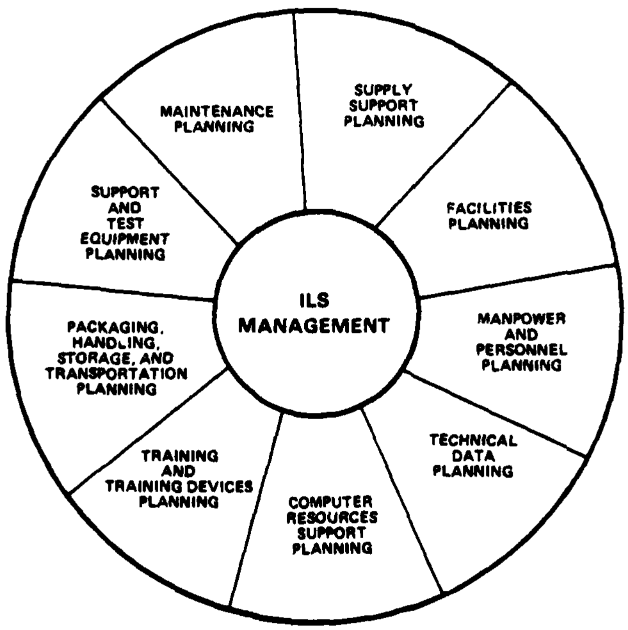


Figure 7-1. ILS Planning Elements

A brief description of ILS planning elements follows:

- Maintenance Planning—establishes concepts and requirements for each level/echelon of maintenance in response to the economics of support resources.
- Supply Support Planning—ensures the timely and effective accomplishment of provisioning, distribution, and inventory replacement of spares, repair parts, and supplies.
- Support and Test Equipment Planning—ensures the timely development/acquisition of ancillary equipment required to support the primary equipment being acquired.
- Packaging, Handling, Storage, and Transportation Planning—identifies the constraints and procedures imposed on equipment to ensure the capability to effectively package, handle, store, and transport the equipment being acquired.
- Facilities Planning—identifies the facilities required for operational/maintenance support of the equipment being acquired.
- Manpower and Personnel Planning—defines requirements for trained operators and maintenance personnel to man/support the equipment.
- Training and Training Devices Planning—identifies the training and training aids required for proper operation and maintenance of the equipment.
- Technical Data Planning—ensures the timely acquisition and distribution of information required to develop, produce, deliver, operate, and maintain the equipment.
- Computer Resources Support Planning—identifies any special computer support required for the operation and maintenance of the equipment.

As equipment specifications and support concepts are developed, the planning elements undergo continuous change. Following final design decisions, a single support concept for each element is established. The individual ILS element planning responsibilities which each FLS element manager must plan, organize, direct, and control are summarized in the following paragraphs.

7.5 FLS MAINTENANCE PLANNING

The maintenance goal for FLS equipment is to limit the maintenance and logistic support burden placed on tactical units to the very minimum required to maintain a responsive combat-ready posture. Organizational maintenance, as the responsibility of the unit assigned the equipment, will, whenever practicable, be performed by assigned unit personnel having a minimum of specialized training. This type of maintenance consists of preventive maintenance and minor parts replacement. Intermediate maintenance will be performed by the Maintenance Battalion, FSSG, with emphasis on the use of field contact teams when feasible. Specific maintenance activities and fifth echelon depot maintenance

requirements are to be derived from analyses of support engineering requirements during engineering development. Whenever feasible and practical, fifth echelon maintenance of FLS equipment will be performed at MCLB, Albany and/or MCLB, Barstow. However, due to the complexities of some FLS items relative to rebuild requirements, certain fifth echelon maintenance may have to be performed by other Service or contractor activities.

It is currently anticipated that some contractor maintenance support will be required for some FLS equipment throughout its development cycle and for a short interval between first article production delivery and the availability of Marine Corps maintenance resources. A fairly rapid turnover of maintenance responsibilities to Marine Corps activities would occur thereafter, as expertise is developed, support resources become available, and the maintenance plan becomes operational. Although all FLS equipment will be subjected to extensive development testing, the use of such equipment and its associated support equipment in operational environments will undoubtedly reveal some maintenance shortcomings which require correction. Consequently, during engineering development and developmental and operational testing, maintenance information must be extracted to properly evaluate the maintenance support program for each FLS equipment. Continuing analysis in the field by operational units will provide the basis for improvement in terms of performance, maintainability, reliability, and economic desirability without degradation of performance. Such shortcomings or recommended improvements will be reported primarily through the use of the quality deficiency report as described in MCO 4855.10.

For example, certain maintenance problems pertaining to large shelters have been identified in QDRs submitted by field units after erecting prototype shelters. These reports have been analyzed and remedial actions incorporated into the current large shelter procurement specifications to eliminate the noted deficiencies.

Similar actions should be followed to correct future problems by incorporating appropriate specification changes to procurement contracts.

Primary maintenance planning activities to be accomplished during FLS equipment acquisition include the following:

a. <u>Exploratory Development</u>

- Review of maintenance requirements for equipment to be replaced.
- Identification of new maintenance requirements necessary to support new equipment missions.
- Analysis of operational requirements to determine the impact of new maintenance requirements.
- Analysis of alternative maintenance concepts for new equipment.
- Consideration of reliability and maintainability tradeoffs.
- Establishment of equipment maintenance concept.

- Determination of feasibility and desirability of centralized fifth echelon maintenance support by the lead service procuring the equipment.
- Determination of equipment requirements for mobile maintenance facilities in the field.
- Evaluation of the need, if any, to expand existing FSSG maintenance support facilities.
- Development of maintenance plan requirements.
- Establishment of maintenance evaluation criteria for prototype testing.
- Evaluation of the contractor-proposed maintenance plan.
- Approval of the maintenance plan and its incorporation within the acquisition plan.

b. Engineering Development

- Accomplishment of pertinent logistic support analyses.
- Determination of specific maintenance support actions.
- Identification of pertinent reliability and maintainability requirements.
- Development of acquisition action schedule to ensure timely procurement and availability of maintenance support resources.
- Evaluation of maintenance effectiveness during prototype testing.
- Revision of maintenance plan where appropriate.

c. Production/Deployment

- Performance of maintenance evaluation.
- Identification and analysis of maintenance support deficiencies.
- Evaluation of the degree of achievement of reliability and maintainability goals.
- Development of proposed modifications for equipment or maintenance support activities as appropriate.
- Revision of the maintenance plan, as required.

7.6 FLS SUPPLY SUPPORT PLANNING

Successfully maintaining the operational readiness of FLS equipment and effectively supporting the various equipment maintenance plans depends, in large part, on the capability of the Marine Corps supply system. Consequently, the supply support goal for FLS is to ensure the timely availability of spares and repair parts and support equipment. This is necessary to meet the requirements of each repair echelon while maintaining overall supply cost-effectiveness. FLS production contractors or lead Service supply activities, as appropriate, will provide initial outfitting of selected repair parts and maintenance list components. This is done prior to or concurrently with equipment deliveries. Assumption

of full responsibility by the Marine Corps supply system for allowances, requisitioning, stocking, and replenishment of spares and components will be accomplished after a usage data development period. This period may extend from 3 to 24 months beyond the end item delivery date, depending on the particular support needs of the equipment.

The purpose of FLS provisioning is to determine and obtain the range and quantity of repair parts, tools, publications, and support equipment required for initial support of FLS equipment. Provisioning includes the identification, selection, and acquisition of items required for maintenance purposes. It also includes the timely preparation of instructions to ensure that requisite initial support items are properly positioned within the supply system.

Provisioning procedures for FLS equipment should ensure that support extends from the in-service date until sufficient usage data is developed. MCLB, Albany has the responsibility for determining the range and depth of items required to support FLS equipment during this usage development period.

Periodic supportability tests will be conducted by MCLB, Albany to determine if the Marine Corps supply system is prepared to fully support FLS equipment. This will include an investigation of inventory records to determine the percentage of provisioning items within the supply system. Normally, the supply system would be considered capable of supporting FLS equipment when 90 percent of all provisioned items have been received. When this capability is reached, the interim supply support program will be disestablished and MCLB, Albany will assume full supply support responsibility for the end item. At this point, the provisioning process will have been completed and all interim supply support processes will terminate.

Requirements for initial stockage of FLS equipment support items will be determined in accordance with MCO P4400.79. Issuance of these items will be accomplished to appropriate users in accordance with the advanced logistic order (ALO) for each end item. The ALO will be published by Headquarters Marine Corps and will include the following information:

- Number and type of Marine Corps units scheduled to receive specific FLS equipment.
- Unit descriptions of supporting units which will provide maintenance and/or supply support for receiving units.
- Density of end items to be supported by supporting units.
- Density of spare/repair parts to be stocked by both receiving and supporting units.

For example, the Marine Corps is seeking the delivery of the HMMWV in FY84. This is sooner than delivery is planned for the Army which has the lead Service responsibilities for the development, procurement, and provisioning of this vehicle. There are certain

long leadtime spare parts that must accompany initial deliveries of these vehicles. Accordingly, provisioning inputs for these parts will commence approximately 1 month after a production contract is awarded. Since it is not anticipated that Army provisioning functions for the HMMWV will be responsive for initial Marine Corps deliveries, some system of interim support will be required. This may be accomplished through a coordinated effort between Army and Marine Corps provisioning agencies.

Primary supply support planning activities to be accomplished during FLS equipment acquisition periods include the following:

a. Exploratory Development

- Analysis and assessment of the supply system capability to support projected resource requirements for the proposed equipment.
- Identification of any supply support constraints to be evaluated during reliability and maintainability studies.
- Definition of supply support responsibilities for the Marine Corps, contractor, and lead Service, as appropriate.
- Establishment of the supply support concept.
- Development of the supply plan.
- Establishment of provisioning requirements criteria.
- Evaluation of contractor proposals for equipment provisioning and support.
- Approval of the provisioning plan.

b. Engineering Development

- Analysis of requirements for joint Service cataloging of personnel to participate in the provisioning process.
- Coordination with lead Service, as appropriate, regarding preparation of a single supply support plan.
- Establishment of a joint Service agreement concerning lead Service representation in scheduled provisioning conferences.
- Evaluation of supply support concept, supply plan, and provisioning plan.
- Ensuring that the supply plan and provisioning plan complement the maintenance plan.
- Development of distribution plans and delivery schedules.
- Development of inventory control procedures.

c. Production/Deployment

- Procurement of spares and repair parts.
- Delivery of spares and repair parts to users.
- Verification of suitability of spares and repair parts.
- Validation and revision of the supply plan.

- Identification of supply support deficiencies.
- Revision of allowance and distribution plans as appropriate.
- Revision of inventory control procedures.

7.7 SUPPORT AND TEST EQUIPMENT PLANNING

The support and test equipment (S&TE) concept for FLS equipment is predicated on ensuring that the following actions occur:

- Required S&TE is identified during the development cycle.
- The equipment provides the capability to expeditiously transport/support/test/emplace/erect the end item. It can also perform unscheduled and scheduled maintenance for the end item in accordance with the maintenance plan.
- The equipment is available to the operating forces and supporting maintenance echelons when end items are placed in service.
- The equipment requirements are continuously updated and problems related to end item support are identified.

FLS common support equipment is defined as those equipment items that will be required for the receipt, inspection, functional operation, calibration, maintenance, emplacement, erection, transportation, or storage of FLS equipment. This support equipment may be:

- In the Marine Corps inventory available through the federal supply system.
- Under development/procurement.
- Commercially available.

FLS special support equipment is defined as those items and tools which have applications unique to FLS equipment.

Primary S&TE planning activities to be accomplished during FLS equipment acquisition cycles include the following:

a. Exploratory Development

- Identification of potential S&TE requirements for the equipment as related to existing S&TE in the Marine Corps inventory.
- Establishment of S&TE concepts for the support of FLS equipment.
- Identification of existing S&TE in the Marine Corps inventory which could provide the required support.
- Identification of new S&TE required to support FLS equipment.
- Development of procedures for screening of contractor-recommended tools, test, measurement and diagnostic equipment.
- Development of procedures, in coordination with lead Service, for standardizing tools required for the equipment.
- Development of a S&TE plan to provide the required end item support.

- Development of S&TE evaluation criteria for engineering development of FLS equipment.

b. Engineering Development

- Validation of S&TE requirements during end item testing.
- Identification, design, and development of S&TE peculiar to FLS equipment.
- Ensuring the demonstration of S&TE concepts as part of FLS equipment testing.
- Verification of the availability of S&TE, resident in the Marine Corps inventory, to support the FLS end item.
- Revision of the S&TE plan, as appropriate.

c. Production/Deployment

- Accomplishment of final review and acceptance of the S&TE plan.
- Procurement of S&TE peculiar to FLS equipment needs and additional common S&TE, as appropriate.
- Issuance of special S&TE to units equipped with FLS equipment, as appropriate.
- Validation and updating of S&TE requirements.
- Identification of S&TE deficiencies.
- Procurement of additional S&TE, if required.
- Issuance of new S&TE to appropriate units required to support FLS equipment.

7.8 PACKAGING, HANDLING, STORAGE, AND TRANSPORTATION PLANNING

The packaging, handling, storage and transportation (PHS&T) concept for FLS is predicated on ensuring that systematic actions are taken to minimize any deterioration while equipment is in transit and/or storage. The degree of preservation, packaging and packing for all FLS equipment will be in accordance with DOD Instruction 4100.14. Adequate protective packaging, using approved packing materials, will reduce losses due to shock damage and reduce deterioration to a minimum. The objectives of FLS equipment packaging are as follows:

- Ensure uniformity among production contractors in the application of packing and marking methods.
- Develop cost-effective procedures in the use of packaging/packing materials.
- Establish only those markings necessary for effective identification, handling, shipment, and storage.
- Ensure maximum equipment life, utility, and performance through prevention of deterioration.
- Facilitate efficient receipt, storage, transfer, and issue of equipment.

PHS&T planning activities to be accomplished during FLS equipment acquisition cycles include the following:

a. Exploratory Development

- Identification of PHS&T requirements necessary to support new equipment missions.
- Identification of current capabilities to handle, store, and transport the equipment.
- Evaluation of the effects of PHS&T support alternatives for the equipment.
- Establishment of PHS&T concepts for the equipment.
- Development of the PHS&T plan for the equipment.

b. Engineering Development

- Evaluation of the adequacy of contractor-proposed PHS&T requirements.
- Identification of packaging criteria for the equipment to include analysis of potential operational environments.
- Evaluation of the PHS&T plan.

c. Production/Deployment

- Evaluation of PHS&T results, as appropriate.
- Identification of any PHS&T deficiencies.
- Updating of the PHS&T plan.

The nature of FLS as the embodiment of an effective means to support mount out, embarkation, transportation, debarkation, and FMF operations in an objective area, lends importance to the PHS&T aspects of system development. This view is reinforced by recent experience regarding PHS&T influences or considerations during FLS end item development. A few of these are noted below to illustrate the relevance of PHS&T planning in the development cycle.

Tests of small shelters of MCESS involving the temporary establishment of a Marine Corps Environment Controlled Medical System (MCEMS) complex at Camp Lejeune in May, 1980 revealed that better provisions were needed to store removable side panels of the 8'x8'x20' rigid and knockdown shelters when these shelters are complexed. These tests have also prompted a change in the side panel's design. This stemmed from the likelihood of plywood panel warping due to random storage and deterioration of the stored panel when fully exposed to the weather. Consequently, a design change from plywood to aluminum facings for the panel is aimed at minimizing deterioration and warpage. A convenient means of storing the side panels is being explored.

The large collapsible shelters pose a number of PHS&T considerations. Components of the 20'x33', 32'x73', and 60'x128' shelters are packaged in bundles with metal strapping.

The bundles are arranged to enable them to be housed in flatracks for handling, storage, and transport. According to the flatrack loading diagram, two 8'x8'x20' flatracks are required for each 20'x33' shelter while five are needed for each 32'x73' shelter. The 60'x128' shelter requires eight 8½'x8'x40' flatracks. Flatracks are also planned for housing joining corridors and complexing kits. This necessitates detailed planning attention for the packaging, handling, and transportation of the shelter components. It is particularly important that the components of each shelter be kept intact, not only to preclude loss but to avoid the mixing of components of one shelter with another shelter as well. The latter particularly refers to the close tolerances of mating parts and the differences in stresses of assembled shelters which could cause distortion in these parts. If the same mating parts are not used in erection and disassembly, difficulty will be experienced. Thus, the integrity of shelter parts should be maintained throughout its service life. This consideration should receive careful attention during PHS&T operations.

Flatrack acquisition is currently lagging behind the acquisition of large shelters. The prohibition of service ownership was recently waived by OSD and flatracks are now budgeted in FY82.

Packaging of the medium girder bridge to facilitate handling, storage, and transportation is a prime example of the role of PHS&T in the FLS development cycle. Here, ongoing analysis of the use of ISO-standard 8'x8'x20' containers for components of the bridge and erection equipment indicates potential benefit of protecting components from loss while enhancing handling and transportability. Further, the use of modified containers in the dual role of flotation devices for the wet-gap bridge configuration is a conceptual feature of the bridge packaging that is being investigated along with alternative approaches which are being considered. The packaging requirements for the MGB must ultimately adopt the field erection and disassembly needs in addition to meeting transportation standards. In this regard, the Army currently transports MGB components in palletized units via 5-ton dump trucks and/or utility trailers. This method will have to be modified if only the FLS logistics trailer is used to satisfy Marine Corps requirements.

Additionally, transportation and handling aspects of ILS planning have impacted on the design of the LACH. Because of clearance problems anticipated in transporting the LACH on amphibious ships in its operating mode (height of 19 feet 1 inch, width of 13 feet 2 inches, and length of 34 feet 10 inches), the LACH has been designed to provide for partial disassembly into a reduced envelope for shipping. The superstructure and vertical flanges can be disassembled and bolted to the backbone. This reduces the height to under 10 feet and the width to under 8 feet. As a consequence, properly trained personnel are required in the Landing Support Battalion to reassemble and disassemble the LACH in the AOA.

7.9 FLS FACILITIES PLANNING

The goal of facilities support related to the introduction of FLS equipment is to ensure that all required training, maintenance, supply, storage, transport, and operational facilities are available in a timely manner. FLS provides the facilities to accommodate depot storage and to satisfy field maintenance requirements including aircraft hangars.

Primary facilities planning activities to be accomplished during FLS equipment acquisition cycles include the following:

a. Exploratory Development

- Evaluation of facilities support requirements for FLS equipment and comparison with existing facilities capability.
- Performance of facility tradeoff analyses, as appropriate, for each FLS equipment.
- Establishment of a facilities support concept.
- Development of a facilities support plan.

b. Engineering Development

- Establishment of facility plan evaluation criteria.
- Verification of prototype test facilities available for FLS equipment.
- Evaluation of the functional support characteristics of available facilities as they relate to the particular FLS equipment to be tested.
- Validation and revision, as necessary, of the facilities support plan.

c. Production/Deployment

- Activation of operational support facilities.
- Identification of facilities support deficiencies.
- Modification of facilities, as appropriate.
- Revision of facilities support plan.

An example of improved facilities space utilization inherent in FLS is the container subsystem. An economic analysis of FLS containers included a comparison to current wooden boxes and pallets. It indicated a 40 percent reduction of storage space for equal amounts of equipment/supplies contained within the containers or loaded within/on the boxes and pallets. Additionally, the ability to safely and conveniently stack PALCONs and QUADCONs and still have easy access to their contents offers significant advantages over the present system in space utilization. Repair parts storage and issue from inserts within QUADCONs also reduce covered storage requirements and facilities support.

Present plans for utilization of large shelters are to store the entire inventory, less requisite training allowances, at MCLB, Albany until they are operationally employed. This will require approximately 68,000 square feet of storage space commencing in FY82 ranging

to a possible maximum requirement of 1 million square feet if the total inventory objective is met in FY88.

7.10 FLS MANPOWER AND PERSONNEL PLANNING

The manpower and personnel concept for FLS is based on limiting the number of personnel required for operation and maintenance of FLS equipment to an absolute minimum in consonance with austere budget forecasts. Recent DOD instructions emphasize the criticality of thorough planning efforts for manpower requirements early in the equipment acquisition process. In this regard, the motor transport subsystem is expected to have the most potential for reducing manpower needs.

On the other hand, personnel requirements for the shelter subsystem, particularly in the engineer and utilities fields, will increase. Two areas of specific concern within these fields where additional skilled personnel workload is foreseen, are:

- Engineer personnel to erect/dismantle large shelters.
- Personnel to install and maintain an increased number of air conditioners and generators that are required for shelters.

A preliminary estimate of manning and training requirements for most of the FLS equipment was contained in the FLS training plan. It was approved in concept by HQMC (Code OT). These initial estimates are refined by the Manpower and Training Requirements Analysis (December 1980.) This document addresses the personnel and training impacts generated by the 57 elements of the FLS as defined in this plan.

The exact number of personnel required to erect and disassemble the large shelters in an operational scenario is influenced by several variables such as the simultaneous construction requirements or the number of days after D-day during which construction is required. An increase of engineer personnel is required for shelters if other engineering priorities dictate concurrent efforts. Otherwise, tradeoffs in shelter reductions or task priorities and sequencing must be made if personnel levels are to remain unchanged. However, some of the workload increase for shelters may be partially offset by engineer requirement reductions attendant in adoption of the medium girder bridge. Also, the requirement for heavy vehicle operators and mechanics will be reduced as a result of vehicle reductions caused by the FLS tactical vehicle fleet.

Primary manpower and personnel planning activities to be accomplished during FLS equipment acquisition include the following:

a. <u>Exploratory Development</u>

- Preparation of preliminary estimates of operator and maintenance skill requirements.
- Development of quantitative and qualitative personnel requirements.

- Identification of the prospective impact of equipment introduction on existing manpower and personnel available to operate/support/ maintain the equipment.
- Development of the manpower and personnel training plan.

b. Engineering Development

- Preparation and validation of personnel program evaluation criteria.
- Conducting labor and personnel requirements analysis based on equipment prototype testing.
- Identification of personnel adjustments including potential reductions, if feasible, to support FLS equipment.
- Revision of the manpower and personnel plan.

c. Production/Deployment

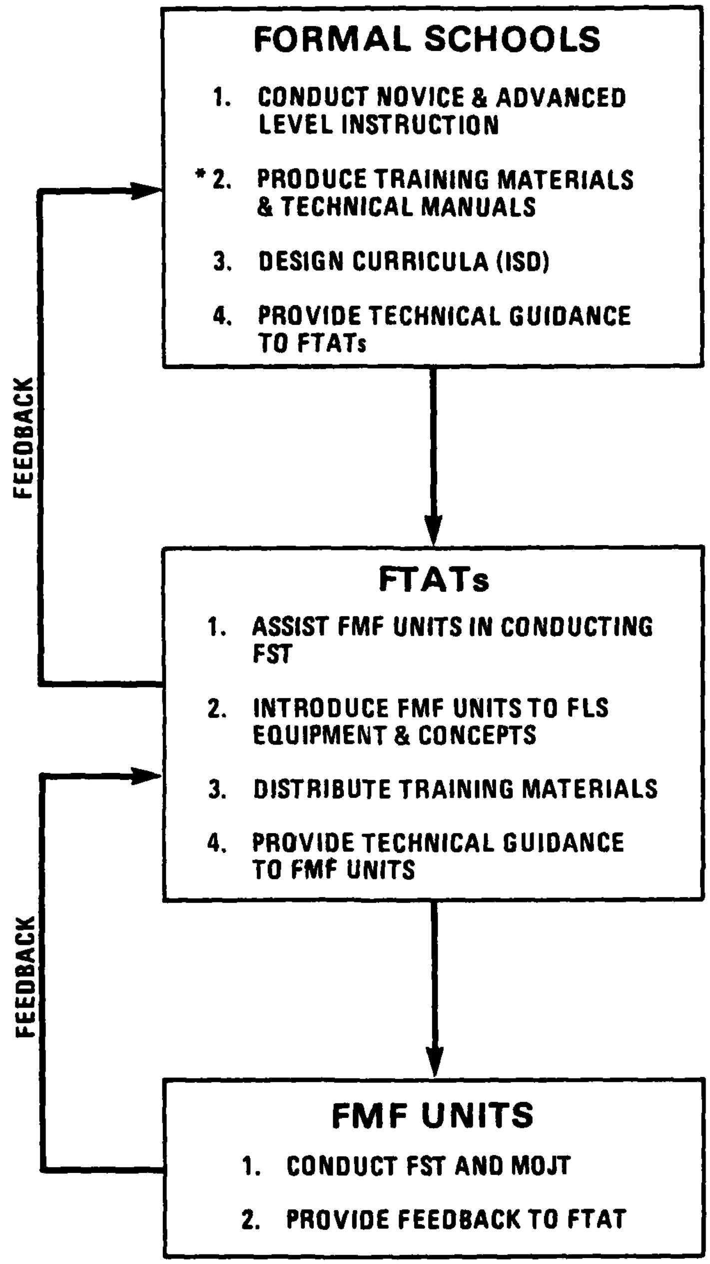
- Validation of personnel requirements.
- Updating and finalization of the manpower and personnel plan.

7.11 FLS TRAINING AND TRAINING DEVICE PLANNING

The training concept is based on a total system concept whereby existing courses of instruction are modified to reflect FLS needs. Also, field skill training is provided to augment formal schools training. FLS training emphasis will therefore be concentrated on the following requirements:

- Familiarization of Marine Corps personnel with FLS equipment before it becomes operational.
- Familiarization of supporting maintenance activities with technology of FLS equipment in order to enhance the long-range maintenance effort.
- Development of a cadre of qualified instructors for use in formal schools and as members of field training assistance teams (FTATs).

The requirement for training personnel in the operation and maintenance of FLS equipment will necessitate the modification of existing formal school courses. Additionally, training resources must be developed prior to the transitional period for FLS equipment. This will facilitate the timely formulation of instructor materials and training devices and their dissemination to appropriate personnel. FTATs will be established to conduct onsite instruction where FLS equipment is scheduled for introduction. Formal schools will provide related instruction at the appropriate specialty school. Additionally, FTAT instructors will be required to provide field maintenance training on third- and fourth-echelon maintenance tasks to appropriate personnel in the Maintenance Battalion, FSSG. This training will be conducted as part of the FLS transition program. When the transition to FLS is completed and all appropriate units have been trained, the FTATs will be disestablished. Further formal training support will be placed entirely on the formal school. Figure 7-2 illustrates



* CURRENT RESOURCES AND POLICY PRECLUDE FORMAL SCHOOLS FROM PROVIDING THIS SERVICE EXCEPT THROUGH CONTRACTUAL SUPPORT.

Figure 7-2. Training Link Between Formal Schools and FMF Units

the relationships involved in the FTAT linkage of the formal schools with FMF units during the FLS transition period.

A detailed description of estimated training requirements for most FLS equipment is contained in the FLS training plan. As noted earlier, these initial estimates are being refined in an ongoing manpower and training requirements analyses. Subsequently, they will be validated through field experience in the testing of preproduction equipment.

Requirements for training aids, training devices and technical manuals to support FLS should be determined by the appropriate formal school in concert with the appropriate development and acquisition personnel at HQMC and MCDEC.

Some examples of FLS training considerations are as follows:

- The large shelter requires seven 14-hour days to erect. Skills involved include surveyor, grader operator, crane operator, metal worker, electrician and combat engineer. The manufacturer indicates the largest shelter can be erected and disassembled six times, after which it becomes unserviceable. Users of the shelter will require training on interior layout, maintenance, erection and disassembly. It does not appear feasible to require each class at the Engineer School to erect and disassemble the large shelter. Rather, alternatives such as partial erection and disassembly of a training shelter complemented by use of scale models and components through lecture/demonstrations must be considered. Training aid alternatives must be developed, assessed, and programmed for subsequent procurement by HQMC. In addition, welding and metal working skills may be advanced in practical application classes to enhance the shelter life beyond six erections and dissasemblies.
- The medium girder bridge will require less training than is currently provided for the two existing bridges. Erection of a medium girder bridge by students is feasible and desirable within both the formal and FST modes.
- Some training will not change. Many of the electrical and metal working skills required for installation and maintenance of FLS elements are currently taught in formal schools. Although some equipment fittings and configurations are different, performance requirements are the same.
- Formal school for medium and heavy prime mover operators and container handler operators.

Primary training and training device activities to be accomplished during FLS acquisition include the following:

a. <u>Exploratory Development</u>

- Development of training concepts for the new equipment.
- Analysis of the requirements for formal, on-the-job, and familiarization training.
- Analysis of requirements for instructor training.

- Identification of requirements for contractor assistance relative to development of training materials and for training instructors.
- Development of the preliminary training plan.

b. Engineering Development

- Preparation and validation of training program evaluation criteria as part of equipment prototype testing.
- Evaluation of contractor-proposed training plans.
- Conduct training analyses based on prototype testing.
- Identification of training deficiencies.
- Identification of requirements for factory training.
- Finalization of requirements for training materials including training aids, training devices, and technical manuals.
- Identification of lead Service/participating Service responsibilities related to joint training requirements and training materials.
- Updating of the training plan.

c. Production/Deployment

- Validation of training requirements.
- Procurement of training materials.
- Commencement of instructor training.
- Updating and finalization of the training plan.

7.12 FLS TECHNICAL DATA PLANNING

Precise technical data is critical for successful program development, acquisition, and fielding of FLS equipment. Significant advances have been made during the past year in the shelter and material handling subsystems to ensure the availability of accurate specifications, drawings, and technical manuals.

For example, the procurement contract for large shelters includes the following deliverables:

- Updated technical manuals for erection instructions.
- A complete revision of all drawings to include past modifications and changes anticipated during production.

Similar actions have been taken on the present small shelter prototypes contract. A complete set of Level 3 drawings, in conformance with DOD-STD-100C, will be provided by the contractor.

In the MHE subsystem, a draft purchase description for the LACH has been developed by the Civil Engineering Support Office under Marine Corps contract. Procurement actions are planned during FY81.

Although significant progress has been made during the past year in development of technical data, continued emphasis and effort is required to ensure proper management of specifications, drawings, and technical manuals through the entire program development for each FLS item. Detailed planning requirements for technical data are described in chapter 5.

7.13 FLS COMPUTER RESOURCES SUPPORT

The only unique computer resources support envisioned for FLS equipment is the Simplified Test Equipment—Internal Combustion Engine (STE—ICE) minicomputer required for diagnostic testing of vehicles.

Present plans are to procure enough of these minicomputers to satisfy all diagnostic testing requirements except those associated with first echelon maintenance.

7.14 LETTER OF ADOPTION AND PROCUREMENT (LAP)

The LAP is a key document which summarizes the ILS planning for equipment acquisitions. This document assigns responsibilities for the accomplishment of various support actions by HQMC. It also is the primary reference for inclusion of equipment in the Logistics Management Information System (LMIS) and NAVMC 1017 (Table of Authorized Material) (TAM). Part I of the LAP, the Planning Data Sheet, should be promulgated shortly after program initiation to alert all appropriate Marine Corps agencies that a new equipment is under development and to inform them of the anticipated acquisition schedule. Part II of the LAP, the Logisitcs Support Data Sheet, provides detailed planning information on all of the necessary logistic support requirements determined from the LSA. Part II must be completed prior to Milestone III of the acquisition process.

Projected LAP requirements for applicable FLS elements through 1982 are displayed in table 7-1. The quarter and fiscal year when elements require completed LAPs are indicated in the Part I and Part II columns.

7.15 INTEGRATED LOGISTIC SUPPORT PLANS (ILSPs)

The primary management tool for defining and coordinating the logistic support process for a new system, subsystem, or, in some cases, for a complex and costly individual element, is the ILSP. Existing Marine Corps policy, outlined in MCO 5000.10 and HQO P4105.1, requires that an ILSP be prepared for all equipment acquisitions meeting IPR and/or MSARC review criteria. The ILSP is usually developed prior to the Milestone II (Full-Scale Development) decision and is periodically updated until the equipment is fielded. This provides an orderly development of solutions to support problems relating to maintenance,

Table 7-1. LAP Completion Deadlines (By Quarter of Fiscal Year)

FLS Equipment Item	LAP Part I	LAP Part II
Insert	C	3-82
PALCON	C	3-82
QUADCON	C	3-82
Shelter 8'X8'X20' Knockdown	C	3-81
Shelter 8'X8'X20' Rigid/GP	C	3-81
Shelter 8'X8'X20' EMI	C	3-81
Shelter 8'X8'X10' EMI	C	3-81
Shelter Joining Corridor 7'X7'X11'	C	3-81
High Mobility Multipurpose Wheeled Vehicle	C	2-82
Heavy Prime Mover	C	1-83
Logistics Trailer (22½-ton)	C	1-83
Bridging, Wet Gap	3-81	-
Fuel/Water Storage Module	C	3-82
Fuel Pump Module	C	3-81
Sanitation Unit	2-81	-
Combined Laundry/Bath Unit	1-82	-
Refrigeration System	C	4-81
Field Feeding System	4-80	-
Bakery System	1-81	-
Steam Cleaner Unit	4-80	2-81
Bath/Shower Unit	C	4-81
MCEMS	C	3-81
Firefighting Equipment	4-82	3-81

C—Completed, may require update

supply provisioning, test equipment, transportation and handling, technical data, funding, personnel, and training. It also ensures that support resources are properly programmed in conjunction with FLS equipment introduction plans.

Because of the varied FLS component interdependencies, ILSPs for shelters and containers, describing 17 individual elements, have been developed on a subsystem rather than an individual component basis. Both of these ILSPs have been reviewed by appropriate

HQMC staff elements and MCLB, Albany. These are currently being updated based on staffing comments. Additionally, a draft ILSP has been prepared for the motor transport subsystem. However, subsequent guidance directed that FLS motor transport elements undergo future milestone reviews on an individual or tandem element basis rather than as a subsystem.

Therefore, the existing draft ILSP for the motor transport subsystem will be fragmented into separate ILSPs for each element or element group scheduled for milestone review. Part II of the LAP, the Logistics Support Data Sheet, will provide detailed planning information on all necessary logistic support requirements for individual components when ILSPs are not prepared. Required ILSPs will be developed in accordance with the schedule depicted in table 7-2.

Table 7-2. ILSP Development Schedule (By Quarter of Fiscal Year)

FLS Subsystem	Subsystem Elements	Draft ILSP	Prelim ILSP	Updated ILSP
Shelter	9	C	1-81	4-81
Container	8	C	4-80	4-82
Motor Transport	7	C	-	-
HMMWV 5/4T	1	2-81	1-82	4-83
Log Veh/Trlrs	4	1-81	4-81	4-82
HHMTT	1	1-81	TBD*	TBD
Semitrlr, 65T	1	2-83	3-83	3-85

*TBD—To be determined

7.16 ADVANCE LOGISTIC ORDER (ALO)

Promulgation of ALOs is required for all equipment at least 6 months prior to their initial issue to the FMF. The ALO provides information to Marine Corps field commanders concerning the introduction of the new items. To ensure that this requirement is met, a draft ALO must be prepared prior to Milestone III. Based on existing acquisition schedules, the required preparation of draft and final ALOs through FY82 are based on the schedule contained in table 7-3.

Table 7–3. ALO Schedule

Element	Draft ALO	Final ALO
Insert	3–82	–
PALCON/PALCON Rack	3–82	–
QUADCON/QUADCON Rack	3–82	–
Flatrack 8'X8'X20'	1–82	–
Flatrack 8½'X8'X40'	1–82	–
Shipping Frame 8'X8'X10'	4–80	4–81
Shipping Frame 4'X6-2/3'X8'	4–80	–
Shelter 60'X128'	C	3–81
Shelter 32'X73'	C	3–81
Shelter 20'X33'	C	3–81
Shelter 8'X8'X20' Knockdown	4–81	–
Shelter 8'X8'X20' Rigid/GP	4–81	–
Shelter 8'X8'X20' EMI	4–81	–
Shelter 8'X8'X10' EMI	4–81	–
Shelter Joining Corridor 7'X7'X11'	4–81	–
High Mobility Multipurpose Wheeled Vehicle (HMMWV)	2–82	–
Heavy Prime Mover	4–82	–
Logistics Trailer (22.5-Ton)	4–82	–
Lightweight Amphibious Container Handler (LACH)	C	2–2
Bridging, Dry Gap	4–80	–
Marine Corps Environment Controlled Medical System (MCEMS)	3–81	–
Fuel/Water Storage Module	3–81	–
Fuel Pump Module	3–81	–
Water Purification System	C	1–2
Refrigeration System	3–81	–
Bath/Shower Unit	4–81	–
Lubrication Service Unit	3–81	3–82
Steam Cleaner Unit	3–81	–

CHAPTER 8

SYSTEM VALIDATION AND COST-EFFECTIVENESS

8.1 PURPOSE

The purpose of this chapter is threefold. The first objective is to compare the cost-effectiveness (CE) of the Field Logistics System (FLS) to that of the existing logistics set which for purposes of analysis will also be defined as a system.

To accomplish this, the effectiveness and cost of both systems must be quantitatively established with respect to a common mission. In this case, the two systems are compared relative to their capability to provide logistic support to a Marine Amphibious Force (MAF). The second objective is to compare the total cost of procuring, operating, and maintaining the entire FLS inventory of equipment with the total cost for the existing equipment over a 10-year period of time. Cost predictions for FLS are estimates since they are related to development and procurement over an extended period of time and consequently are not firm. It must be understood, however, that at this time in FLS program development, this cost comparison is only an estimate. Costs of many FLS items have to be estimated since full development and procurement may be up to 10 years distant. Costs of existing equipment were obtained by escalating costs of previous procurements. In some cases, this may not portray an accurate FY82 cost. Additionally, some items of existing equipment may no longer be available for procurement. Another factor which must be kept in mind when reviewing the cost comparisons presented in this chapter is that FLS provides an additional capability that is not available in the present logistic support environment. This capability centers upon the container handling features of the FLS. The third purpose is to identify the equipment makeup of both a notional MAU and MAB after FLS equipment replacements have been completed and to determine the resultant transportability, mobility, and capability of this new equipment mix for less than MAF-size operations.

During 1980, modifications were made to the FLS simulation model to determine the effect of introducing the container handler into the general supply buildup operation. Simulations were conducted using the container handler, as well as the 30-ton crane, to transfer containers, shelters, and flatracks from trailers at inland destinations (CSSA, EAF, etc.). These simulations indicated resource savings when using the faster, more mobile container handler. Potential cost and manpower savings are indicated in section 8.4.16 and 8.4.17.

Two additional element changes to FLS did not significantly affect the simulation model. The 40' mobilizer/transporter was substituted into the model in place of the 22½-ton trailer for transporting 40' flatracks. However, previous simulation runs assumed that the 22½-ton trailer, despite overhang problems in transporting the 40' flatrack, would perform satisfactorily. The quantity of mobilizer/transporters utilized was determined and is indicated in table 8-19. The other FLS element change was the deletion of the air pallet system. This did not impact prior modelling results since the FLS simulation model does not examine container unstuffing operations.

Finally, a modification was made to quantities of FLS items used for the amphibious operation simulation conducted this year. Previous simulations employed notional MAF quantities. Simulations conducted this year used quantities of FLS equipment presently planned for II MAF. This modification resulted in minor changes to throughput rates and equipment utilization.

8.2 BACKGROUND

The objectives stated above have been addressed to answer questions which concern the far-reaching impact of FLS. These questions involve the productivity, transportability, and cost of FLS.

With regard to productivity, the major concern centers on the capability of the new mix of motor transport/MHE to support ANSI/ISO cargo as they move from ship to shore and over the beach to areas within the force beachhead. Assuming that all the supply requirements for a MAF operation can be containerized using pallets, PALCONs, QUADCONs, and 8'x8'x20' containers, the question that remains is whether or not the FLS has the material handling and motor transport equipment necessary to move these containers. Further, are the quantities of equipment sufficient to maintain the necessary throughput rates to meet the deadlines for supply buildup as indicated in existing planning scenarios? And finally, can all of this be accomplished more effectively with FLS than with existing equipment?

Until development of the FLS simulation model, little information had been established to resolve these questions. However, separate studies had been conducted to establish motor transport replacement items. In particular, the conceptual vehicle mix (CVM) analysis identified quantities of trucks and trailers based on replacing present assets with a quantity of FLS equipment required to maintain existing load-carrying capabilities. Further, modifications to MHE were made to facilitate support of the FLS container-handling requirements. These included changes to the 4,000-pound forklift to provide an 8'x8'x20' container stripping capability and introduction of the LACH.

Similar questions have been raised regarding the transportability of FLS equipment on both amphibious and commercial ships. For example, can amphibious shipping provide the capacity and onboard handling for FLS equipment? What is the containership lift requirement for containers, ISO-configured shelters, and service support modules? What terminal facilities will be required if the containership is nonself-sustaining? Are offloading capabilities and landing craft quantities adequate for handling MAF FLS supplies and equipment, and can the throughput be maintained at levels necessary to meet scenario time constraints? What quantity of Navy container offloading equipment is necessary to maintain the required container throughput?

In terms of cost, two questions are addressed in the following analysis. First, is FLS more cost-effective than present procedures for logistics-over-the-shore (LOTS) operations? Stated another way, to provide the MAF supply requirements within the same time frame, will FLS equipment cost less than existing equipment? The second question addressed is How much does all FLS equipment, including shelters, service support, and tactical equipment cost for the entire Marine Corps, and how does this compare with the cost of the equipment being replaced?

8.3 COST-EFFECTIVENESS

Cost-effectiveness is a technique used to compare different systems. It relates system design and system-effectiveness parameters, such as overall capability, operating time, personnel, and equipment, with system costs and determines a cost-effectiveness value for each system through the basic formula:

$$\text{Cost-Effectiveness (CE)} = \frac{\text{System-Effectiveness (SE)}}{\text{Cost}}$$

For such an analysis to be valid, systems must be compared to the same criteria.

8.4 SYSTEM EFFECTIVENESS

Present DOD planning requires that the Marine Corps logistic support system have the capability of transporting the assault echelon (AE) of a MAF and approximately 10 days of supplies into the AOA by D+5. The system must also land and support the assault follow-on echelon (AFOE) with sufficient supplies for the entire MAF for 60 days. In general, the AE will be transported to the AOA in amphibious ships and the AFOE will use commercial shipping.

In determining SE, the measures of effectiveness are:

- Time
- Equipment requirements
- Manpower requirements

To obtain these measures for a new system such as the FLS, the basic approach, short of buying the proposed system and evaluating it through operational testing, is to simulate the operation.

System simulation accomplishes more than determining the effectiveness of the system. Prior to determining any quantitative measures, a model must be established. In creating the system model, the validity of the design can be examined. Often, a system can be discarded at this initial stage of the process due to a lack of capability in some design aspect of a particular subsystem. For example, if a necessary capability of the logistic support system is to efficiently handle 8'x8'x20' containers, then the present system could not be considered a valid alternative.

8.4.1 MAF/FLS Supply Requirement

At the present time, data exist from several studies regarding the total lift requirements (square and cube) to support the AE and the AFOE of a MAF. These studies were initiated because of the growing concern over the capacity of amphibious and commercial breakbulk shipping to adequately transport and sustain a MAF-size operation. Table 8-1 is a summary of these requirements by study.

The variances which exist in these figures can be attributed to the organizational differences in MAFs which were used in the studies and prediction factors regarding equipment requirements, rates of consumption, and attrition. It is evident, however, that in spite of the variations, a central tendency exists around a total of 1.5 million square feet for vehicular-type items and 10 million cubic feet for general cargo.

Initial simulations were performed using container requirements cited in the Containerization Requirements for the Fleet Marine Force (1973-1982) for AE general cargo lift requirements and the U.S. Marine Corps Material Throughput Distribution System (1977-1986) for AFOE general cargo lift requirements. However, these AFOE lift requirements are based on a 90-day buildup, and as indicated above, present planning calls for a 60-day buildup to be transported with the AFOE. Therefore, for the analysis presented here, the general cargo lift requirements for the AFOE (table 8-2) were obtained from the Logistics Plans and Policies Branch (Code LPP), HQMC, and represent current planning for a 60-day buildup.

The vehicular lift requirements (square footage) are based on the Logistic Management Information System (LMIS) figures. The LMIS information is used by HQMC for planning purposes and agrees in total with the SRI throughput study. An item-by-item check was made of the number of square-loaded items authorized for a MAF. This figure falls within 6 percent of the LMIS figures (11,700 items to 12,400 items). Based on the above analysis, it

Table 8-1. A Comparison of MAF Square and Cube Requirements

Study/ Data Source	SRI[1]	ALAS[2]	MCDEC[3]	NSRDC[4]	LMIS[5]
		Total Square and Cube Requirements (Existing)			
Square	1,435,000 sq. ft.	1,939,000 sq. ft.	--	--	1,424,501 sq. ft.
Cube	10,250,000 cu. ft.	9,296,000 cu. ft.	--	--	8,340,933 cu. ft.
		Square Divided in AE and AFOE (Existing)			
AE	565,000 sq. ft.	693,000 sq. ft.	--	--	775,501 sq. ft.
AFOE	870,000 sq. ft.	1,246,000 cu. ft.	--	940,327 sq. ft	649,000 sq. ft.
		Cube Divided Into AE and AFOE (Existing)			
AE	1,650,000 cu. ft.	2,960,000 sq. ft.	1,436,451	--	1,551,993 cu. ft.
AFOE	8,600,000 cu. ft.	6,336,000 sq. ft.	--	8,423,600 cu. ft.	6,789,000 cu. ft.

[1] SRI—Marine Corps Material Throughput Distribution System, Stanford Research Institute.

[2] ALAS—Advanced Logistics Analysis Study, Marine Corps Development and Education Command.

[3] MCDEC—Containerization Requirements for the Fleet Marine Forces, Marine Corps Development and Education Command.

[4] NSRDC—*Merchant Shipping* and *Transfer* Craft Requirements in Support of Amphibious Operations, Naval Ship Research and Development Center.

[5] LMIS—Logistics Management Information System, Headquarters, USMC.

was determined that the square and cube requirements for existing equipment are as shown in table 8-2. Broken stowage factors have not been included in these square and cube requirements, since these quantities are pure cargo estimates.

With regard to the presently planned distribution of FLS equipment to II MAF, there are 3,000 less vehicles and 4,500 more shelters and service support containers. This equates to a reduction of 270,000 square feet and an addition of approximately 5,700,000 cubic feet to the MAF's lift requirement.

Table 8-2. MAF Existing Square and Cube Requirements

	Square	Cube
AE	775,501 sq. ft.	1,436,451 cu. ft.
AFOE	649,000 sq. ft.	5,857,280 cu. ft.
Total	1,424,501 sq. ft.	7,293,731 cu. ft.

Most of the savings in square footage (240,000) are realized in the AFOE. Conversely, all of the additional cube requirement must be found in the AFOE. Table 8-3 illustrates the MAF lift requirements as a result of FLS-generated modifications.

Table 8-3. MAF FLS Square and Cube Requirements

	Square	Cube
AE	745,000 sq. ft.	1,436,451 cu. ft.
AFOE	409,000 sq. ft.	11,557,280 cu. ft.
Total	1,155,000 sq. ft.	12,993,731 cu. ft.

Current data regarding FLS shelter and vehicle requirements is contained in the following studies:

- MCESS qualitative requirements
- MCESS qualitative/quantitative requirements update
- Conceptual vehicle mix (CVM) analysis

The number of FLS shelters and vehicles required by the MAF and the required square and cube were based on these studies.

Table 8-4 lists all elements involved in the MAF assault. The quantities of FLS equipment reflect currently envisioned distribution of FLS equipment to II MAF (see FLS Equipment Distribution Matrix, June 1980, Northrop Services, Inc.). The AE pallets, PALCONs, and QUADCONs indicate the quantity required to containerize the 1,436,451 cubic feet of supplies, ammunition and organic material, with approximately 65 percent on pallets

and the remainder divided equally between PALCONs and QUADCONs. A 20-percent broken stowage factor was included for packing purposes.

Similarly, the AFOE supplies were loaded into containers and QUADCONs and the quantities shown in table 8-4 indicate the container and QUADCON requirements to pack all AFOE supplies using, again, a 20-percent broken stowage factor.

Except for FLS vehicles and MHE, square-loaded items were assigned an average weight and square for amphibious and breakbulk shipping.

Table 8-4. MAF FLS Equipment Items

Items	Quantities	Items	Quantities
ASSAULT ECHELON		ASSAULT FOLLOW-ON ECHELON	
Cube-Loaded		Cube-Loaded	
• Pallet	26,320	• Four-Pack (QUADCON)	468
• PALCON	4,990	• Container	5,352
• Eight-Pack (PALCON)	148	• 8'x8'x20' Rigid	1,260
• QUADCON	300	• 8'x8'x10' Rigid	252
Square-Loaded		• 8'x8'x20' Knockdown (4)	420
• Non-FLS Rolling Stock	3,717	• Flatrack (20')	888
• HMMWV	1,727	• Flatrack (40')	408
• HHMTT	315	• Service Support Modules	1,284
• Medium Prime Mover	52		
• Heavy Prime Mover	55	Square-Loaded	
• 12½-Ton Trailer	117		
• 22½-Ton Trailer	100	• Non-FLS Rolling Stock	820
• Mobilizer/Transporter	4	• HMMWV	660
• 30-Ton Crane	17	• HHMTT	660
• Container Handler	5	• Medium Prime Mover	80
• LACH	14	• Heavy Prime Mover	60
• 4,000-Pound Forklift	50	• 12½-Ton Trailer	120
• 6,000-Pound Forklift	65	• 22½-Ton Trailer	70
• 10,000-Pound Forklift	44	• 30-Ton Crane	40
• QUADCONs	315	• 4,000-Pound Forklift	40
• Four-Pack (QUADCON)	100	• 6,000-Pound Forklift	60
• Shelter Equivalents	117	• 10,000-Pound Forklift	30

8.4.2 Shipping Capability

The reduction in square footage requirements for the FLS affects the assault and the assault follow-on echelons while the increase in cube affects only the assault follow-on echelon. This is an important change since the critical shipping constraints presently exist in the available amphibious square-lift capacity of the assault echelon.

The Military Sealift Command (MSC) and the Sealift Readiness Program (SRP) indicate the availability of 5 LASH, 13 Ro-Ro, and 11 self-sustaining containerships for use during military mobilization. In view of possible Army requirements for shipping support

and recent developments regarding employment of merchant ships for Rapid Deployment Forces, it is considered realistic to assume that these ships will not be available for Marine Corps need. Thus, for the sake of simulating over-the-beach operations, only breakbulk and nonself-sustaining containerships (NSSC) have been employed for AFOE shipping. Data contained in the Advanced Logistics Analysis Study (as shown in table 8-5) indicated the total MSC and SRP breakbulk ship availability numbers 94, and that of NSSCs is 31. Based on all AFOE equipment and supplies being square-loaded or cube-loaded as ANSI/ISO container equivalents, 10 breakbulk and 12 NSSCs would be required to support the AFOE echelon.

Although it appears that the total MAF/FLS material requirements can be transported by the present amphibious fleet and by fewer commercial ships than are expected to be available, other factors need examination. These include the size and weight of items, the clearances and weight limitations of cargo stowage compartments, and the ability to horizontally and vertically move the equipment.

8.4.3 Shipping AFOE Cube

An examination of the items that will be carried on commercial ships indicates that the cube stowed cargo presents no loading or handling problems. The loading compatibility is guaranteed as a result of the ANSI/ISO container equivalent configuration of all the cube items.

8.4.4 Shipping AFOE Square

For the square-loaded rolling stock, commercial breakbulk ships have the loading capacity to handle any demands which presently exist for a MAF. Since no FLS rolling stock is beyond the weight and size limits of commercial shipping, the existing capability is also adequate for handling these items.

8.4.5 Shipping AE Square

With respect to square-loaded AE items, the critical situations involve clearance for 5-ton trucks loaded with QUADCONs and trailers loaded with shelters, as well as ramp maneuvering of 5-ton trucks carrying QUADCONs or trailers carrying 4 QUADCONs. Of the six types of amphibious ships, based on cargo space clearance heights and ramp capacities, only the LST and LHA are capable of handling the truck/QUADCON and trailer/shelter combinations. The truck/QUADCON configuration requires 12'8" of clearance on the 20^{o} between-deck ramp of the LST because of its 15-foot wheelbase. For the same reason, the trailer/shelter combination requires 12'9" of clearance on the ramp, even though its true vertical height is only 11'6". The ramp clearance is 13'3".

The clearance in the upper vehicle stowage area in the LHA is 15'0".

Table 8-5. Present Amphibious/Commercial Shipping Capacity

ASSAULT ECHELON/AMPHIBIOUS SHIPS

SHIP TYPE	REPRESENTATIVE CAPACITY		# AVAILABLE	TOTAL CAPACITY	
	SQUARE (SQ. FT.)	CUBE (CU. FT.)		SQUARE (SQ. FT.)	CUBE (CU. FT.)
LPD	12,000	40,000	14	168,000	560,000
LST	16,000	3,500	20	320,000	70,000
LSD	7,000	2,000	13	91,000	26,000
LPH	4,000	38,000	6	24,000	228,000
LKA	37,000	65,000	5	185,000	325,000
LHA	28,000	169,000	5	140,000	845,000
			TOTALS	928,000	2,054,000

ASSAULT FOLLOW-ON ECHELON/COMMERCIAL SHIPS

SHIP TYPE	REPRESENTATIVE CAPACITY		# AVAILABLE	TOTAL CAPACITY	
	SQUARE (SQ. FT.)	CUBE* (CU. FT.)		SQUARE (SQ. FT.)	CUBE (CU. FT.)
BREAKBULK	–	643,000	94	3,008,000	60,442,000
LASH	–	1,306,000	5	495,000	6,530,000
RO-RO	–	1,944,000	13	2,522,000	25,272,000
NSSC	–	832,000	31	–	25,792,000
SSC	–	832,000	11	–	9,152,000
			TOTALS	6,025,000	127,188,000

*ALL COMMERCIAL SHIP'S CAPACITIES ARE PRESENTED AS CUBE. HOWEVER, PORTIONS OF THESE SPACES MAY BE USED FOR SQUARE LOADED CARGO, i.e., VEHICLES.

Of the other four types of amphibious ships, the LSDs lack clearance and ramp capacity to handle either the truck/QUADCON or the trailer/shelter configurations. The LPDs, LPHs, and LKAs lack the proper clearance.

It further must be recognized that the current amphibious fleet is designed to mechanically handle pallet-sized loads rather than QUADCONs. However, other less versatile methods exist to accommodate QUADCON loading and unloading to and from such vessels.

It is assumed that ramps could be successfully negotiated with full loads. However, early testing should be accomplished to validate this phase of the operation.

8.4.6 Shipping AE Cube

Present plans call for the AE load to include individual and four-pack QUADCONs, individual and eight-pack PALCONs, and pallets. The only feasible technique for unloading eight-packs of PALCONs from amphibious ships is to stow them as individual PALCONs in LKAs, then assemble them into eight-packs on the below-deck hatch covers where a direct boom lift can be made. Similarly, QUADCONs could be stowed on the below-deck hatch covers where a direct boom lift can be made. Were this done, it would be advisable from a handling viewpoint to stow QUADCONs on the below-deck hatch covers of LKAs and lift them first, making room to assemble eight-packs of PALCONs. QUADCONs can also be individually stowed in the LHA, which is the only amphibious ship carrying a 10,000-pound forklift as part of its organic MHE. However, since this would require using critical vehicle stowage area, the concept was rejected. There is adequate stowage in LKAs for 37 of the eight-packs of PALCONs and 75 of the QUADCONs.

8.4.7 Offloading Pattern

In an amphibious assault, the scheduled waves and on-call serials will be primarily composed of combat-essential equipment. The Amphibious Landing Analysis Study indicates that the first ships offloaded will be LSTs, LPDs, and LHAs. These will be followed by the remaining amphibious ships, and, finally, the commercial ships. Table 8-6 is a general offloading pattern which has been established for a simulated MAF assault based on the above information.

Table 8-6. Unloading Pattern

Items	Ship Type
Rolling Stock/Pallets/PALCONs	LST/LPD/LHA
Rolling Stock/Pallets/PALCONs/QUADCONs	LPH/LSD/LKA
Service Support Modules/QUADCON Four-Packs	NSSC
Rolling Stock	Breakbulk
Containers/Shelters	NSSC

8.4.8 FLS Preliminary Loading Matrix

A loading matrix was developed based on the cargo restraints previously described. This matrix, table 8-7, designates the quantities of ships used in the simulation and the shipping location of every item involved in the operation. It also takes into account the square and cube capacities, handling restrictions, and clearance constraints previously discussed.

Table 8-7. Ships Loading Matrix

	1 PALLETS	2 PALCONS	3 8-PALCONS	4 QUADCONS	5 4-QUADS	6 CONTAINERS	7 8'X8'X20' R	8 8'X8'X10' R	9 8'X8'X20' KD	10 20' FLAT RACKS	11 40' FLAT RACKS	12 SERVICE SPT. MODULES	13 NON-FLS ROLLING STOCK	14 HMMWVs	15 HHMTTs	16 MEDIUM PRIME MOVERS	17 HEAVY PRIME MOVERS	18 12 1/2-TON TRAILERS	19 22 1/2-TON TRAILERS	20 MOBILIZER/TRANSPORTER	21 30-TON CRANE	22 LACH	23 4K FORKLIFT	24 6K FORKLIFT	25 10K FORKLIFT	26 CONTAINER HANDLER
LPD (13)	790												51		15	4		9								
LST (17)													96	34							1	1				
LHA (5)	2292	998											110		24		11		20				10	13		1
LKA (4)			37	75									185	121						1						
LSD (11)	30												12	43											4	
LPH (6)	710													32												
BBK (10)													82	66	66	8	6	12	7		4		4	6	3	
NSSC (12)					39	446	105	21	35	74	34	107														

8.4.9 Amphibious Objective Area (AOA)

The AOA can be considered in terms of strategic locations to which logistic support must be supplied. Normal operational planning for a MAF assault calls for the establishment of one or more colored beaches with two numbered beaches for each colored beach. Combat service support concepts for supply operations require the establishment of at least one initial beach support area (BSA), and one combat service support area (CSSA) by D+5. Based on these factors, and the likely size of the assault operation, the locations, shown in table 8-8, were established within the AOA.

Table 8-8. AOA Destinations

1. Sea Echelon	7. BSA #2
2. Green Beach #1	8. CSSA
3. Green Beach #2	9. Expeditionary Airfield (EAF) (Inside Tactical Area of Responsibility)
4. Red Beach #1	
5. Red Beach #2	10. Division, Wing, MAF Headquarters
6. BSA #1	11. Forward Area

Distances for these locations were obtained from the Civil Engineering Laboratory Technical Note, #N-1514, Earthwork Construction in Support of a Marine Amphibious Force. The sea echelon transport area is 1 mile from the beach. The BSAs are one-half mile inland, the CSSA is 1 mile inland from the BSAs.

8.4.10 Offloading Parameters

The first dynamic logistics process to be performed in a simulated MAF assault operation involved ship offloading. In order to simulate this offloading process, certain parameters had to be established for each type of ship. These parameters were:

- Number of offloading stations
- Offloading rates per station
- Offloading sequence

Data related to offloading stations and rates, shown in table 8-9, were developed from information obtained from the Combat Cargo Officer at COMNAVSURFLANT, the Amphibious Logistics Officer, HQMC, and from the various ships' loading characteristics pamphlets (SLCPs).

The simulation runs have been based strictly on a cargo offloading operation. No consideration has been made to other demands which will be put on the landing craft, particularly in the initial stages of the assault. As a consequence, this situation provides the most severe material transport test for FLS, since it allows for cargo throughput at the fastest rate attainable with the existing naval amphibious support.

Data regarding the offloading sequence is shown in table 8-10.

Table 8-9. Cargo Offloading Times
(in minutes)

ELEMENT \ # OF OFFLOAD STATIONS	LPD	LST	LHA	LKA	LSD	LPH	BBK	NSSC
	2	1	2	4	2	6	4	2
PALLET	2		1		5	5		
PALCON			1					
8-PAC				15				
QUADCON			3	15				
4-PAC								6
CONTAINER								6
8'X8'X20' R								6
8'X8'X10' R								6
8'X8'X20' KD								6
FLAT RACKS--20'								6
FLAT RACKS--40'								6
SERVICE SUPPORT MODULES								6
NON-FLS ROLLING STOCK	10	1	5	7	10		5	
HMMWV	5	1		5	10	15	5	
HHMTT	5	1	5				5	
MEDIUM PRIME MOVERS	10		5				10	
HEAVY PRIME MOVERS			5				10	
12 1/2 TON TRAILERS	10		5				10	
22 1/2 TON TRAILERS			5				10	
MOBILIZER/TRANSPORTER				10				
30 TON CRANE		1			10		10	
LACH		1						
4K FORKLIFT	10	1	5				5	
6K FORKLIFT	10	1	5				5	
10K FORKLIFT		1			10		10	
CONTAINER HANDLER			10					

Table 8-10. Cargo Offloading Sequence

(BY ELEMENT #) (SEE TABLE 8-7 FOR ELEMENT NAME)

LPD	13	15	16	18	1						
LST	13	14	22	21							
LHA	13	15	24	23	17	19	26	1	2		
LKA	13	14	20	3	4						
LSD	13	25	14	1							
LPH	14	2									
BBK	13	14	15	16	17	18	19	21	23	24	25
NSSC	5	12	6	7	8	9	10	11			

(BY AMOUNT/ELEMENT #)

LPD	51	15	4	9	790						
LST	96	34	1	1							
LHA	110	24	13	10	11	20	1	2292	998		
LKA	185	121	1	37	75						
LSD	12	4	43	30							
LPH	32	710									
BBK	82	66	66	8	6	12	7	4	4	6	3
NSSC	39	107	446	105	21	35	74	34			

The other parameters involved in the ship offloading process are landing craft and helicopter capacities, by cargo type, as shown in table 8-11.

Table 8-11. Cargo Capacities (Landing Craft and Helicopter Load Size)

	PALLET	PALCON	8-PAC	QUADCON	4-PAC	CONTAINER	8'X8'X20' R	8'X8'X10' R	8'X8'X20' KD	FLATRACKS-20'	FLATRACKS-40'	SERVICE SPT. MODULES	NON-FLS ROLLING STCK	HMMWV	HHMTT	MEDIUM PRIME MOVER	HEAVY PRIME MOVER	12½ TON TRLR	22½ TON TRLR	MOBILIZER/TRANSPORT	30-TON CRANE	LACH	10K FL	4K FL	6K FL	CONTAINER HANDLER
LCU	150	150	28	40	4	4	4	8	4	4	2	4	8	12	6	6	5	4	4	2	3	3	6	12	8	2
LCM-8	60	60	10	16	1	1	1	3	1	1	1	1	4	4	1	2	2	1	1	1	1	1	2	4	2	1
LCM-6	27	27	5	7	1	1	1	1	1	1	1	2	2	2	1	2	0	0	0	0	0	0	0	1	1	0
CH46	3	3												1												
CH53D	4	4												1												

8.4.11 Cycle Times

The material handling times which were used reflect those indicated in the SLCPs or times recorded during exercises, such as the Logistics-Over-The-Shore (LOTS) test at Fort Story during the summer of 1977. The transport times are based on assumed distances and expected speeds.

Caution must be exercised in considering the results of this modeling effort since it represents ideal offloading conditions. In particular, it must be recognized that the cycle times stated in the SLCPs represent optimum situations. The simulation also assumes that these ideal cycle times can be maintained continuously throughout the assault. No consideration is made for lighterage, helicopter, or motor transport succession time at the transfer facility or for contingencies which can be expected to occur such as mechanical failure and personnel/vehicle casualties. Also assumed is that the ships have the selective unloading and positioning capability to maintain these offloading cycle times at the stated number of stations on a continuous basis and that sea-state and weather conditions are favorable for the duration of operations.

Despite these considerations, it is worth noting again that the ideal operating rates used in this model provide a more severe test of the capability of FLS to handle logistic demands than would be true of a slower offloading rate under less than optimum conditions. This strengthens the confidence in the FLS ability to handle the potential throughput demand.

During the AFOE phase, container offloading is considered to involve use of three Temporary Container Discharge Facilities (TCDFs) and two elevated causeways. The TCDF

is configured by mounting two cranes on the deck of a barge or ship of convenience. The cranes are used to transfer containers from the containership to landing craft. The landing craft subsequently moor to an elevated causeway and the containers are transferred via crane to a tractor/trailer.

8.4.12 Over-the-Shore Operations

Analysis of the MAF assault from an over-the-shore logistic support point of view involved three steps. Step one determined the initial destination of all items in the assault. Table 8-12 is an indication of destinations used for particular elements of the simulation.

Table 8-12. FLS Simulation Elements

ELEMENT NO.	NAME	QUANTITY	DESTINATION	WEIGHT	DIMENSIONS
1	PALLET	26,320	ALL AOA LOCATIONS	2,000 LBS	40" X 41" X 48"
2	PALCON	4,990	BSA's, CSSA, HDQTRS, EAF	1,600 LBS	40" X 41" X 48"
3	8-PAC (PALCONS)	356	HDQTRS	12,800 LBS	80" X 82" X 96"
4	QUADCON	615	BSA's, CSSA	10,000 LBS	60" X 82" X 96"
5	4-PAC (QUADCONS)	360	CSSA	40,000 LBS	6' 10" X 8' X 20'
6	CONTAINER	5,355	CSSA	44,000 LBS	8' X 8' X 20'
7	8'X8'X20' R SHELTER	1,305	HDQTRS, EAF	4,000 LBS	8' X 8' X 20'
8	8'X8'X10' R SHELTER	270	HDQTRS, EAF	2,670 LBS	8' X 8' X 10'
9	8'X8'X20' KD SHELTER	375	HDQTRS, EAF	14,600 LBS	8' X 8' X 20'
10	FLAT RACK (20')	855	EAF	7,000 LBS	8' X 8' X 20'
11	FLAT RACK (40')	465	EAF	20,000 LBS	8' X 8' X 40'
12	SERVICE SUPPORT MODULES	825	CSSA	10,000 LBS	8' X 8' X 20'
13	NON-FLS ROLLING STOCK	4,537	ALL AOA LOCATIONS	8,625 LBS	110 SQ. FT.
14	HMMWV	2,477	ALL AOA LOCATIONS	4,877 LBS	177" X 85" X 77.5"
15	HHMTT	785	ALL AOA LOCATIONS	21,479 LBS	304" X 98" X 96"
16	MEDIUM PRIME MOVER	132	BEACH	21,000 LBS	240" X 96" X 96"
17	HEAVY PRIME MOVER	115	BEACH	35,000 LBS	240" X 96" X 96"
18	12 1/2-TON TRAILER	317	BEACH	7,260 LBS	20' X 8' X 42"
19	22 1/2-TON TRAILER	170	BEACH	9,980 LBS	20' X 8' X 42"
20	MOBILIZER/TRANSPORTER	4	BEACH	16,200 LBS	40' X 8' X 51"
21	30-TON CRANE	37	BEACH, CSSA, HDQTRS, EAF	71,000 LBS	540" X 118" X 155"
22	LACH	14	BEACH	40,000 LBS	36' X 8' X 9'
23	4K FORKLIFT	90	ALL AOA LOCATIONS	8,000 LBS	159" X 82" X 97"
24	6K FORKLIFT	115	BEACH	22,500 LBS	195" X 86" X 125"
25	10K FORKLIFT	72	BSA, CSSA, HDQTRS, EAF	34,820 LBS	290" X 105" X 155"
26	CONTAINER HANDLER	5	CSSA	105,000 LBS	35' X 14' X 11.5'

Step two involved determining the methods by which these destinations would be reached. This required a more detailed analysis. All items in the MAF assault were analyzed in terms of moving under their own power or of requiring handling and/or transporters. Figure 8-1 indicates the resulting sequence of flow of MAF logistics equipment.

Table 8-13 is the listing of equipment items and required MHE used in the simulation runs. In addition to the 30-ton crane, simulations were also executed using the container handler to offload containers, flatracks, and four-packs at destinations.

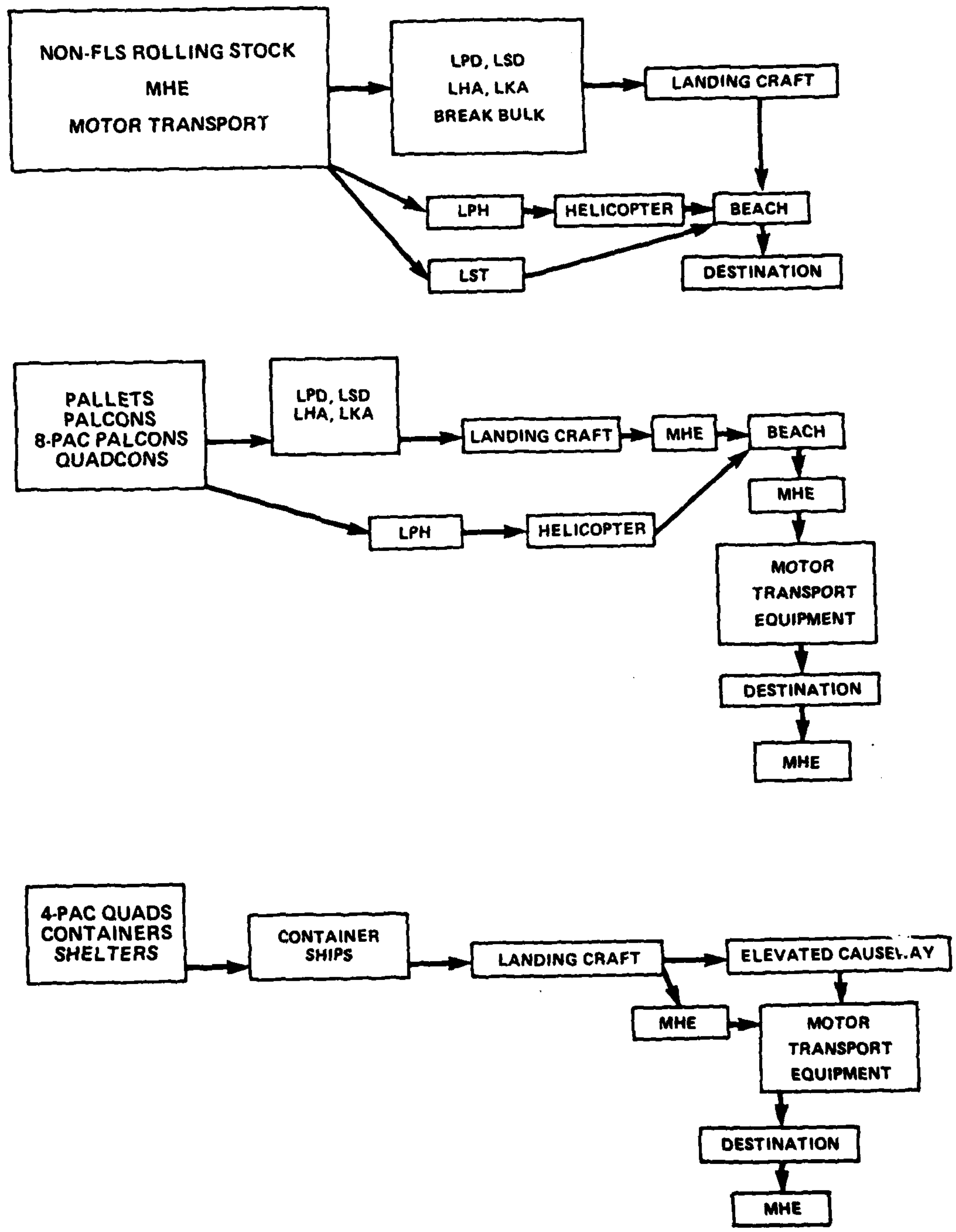


Figure 8-1. Material Flow in AOA

Table 8-13. MHE Requirements by Cargo Type

CARGO TYPE	MHE
PALLET	6K FORKLIFT (BEACH) 4K FORKLIFT (DESTINATION)
PALCON	6K FORKLIFT (BEACH) 4K FORKLIFT (DESTINATION)
8-PAC	10K FORKLIFT
QUADCON	10K FORKLIFT
4-PAC	LACH (BEACH) 30 TON CRANE (DESTINATION)
CONTAINER	LACH (BEACH) 30 TON CRANE (DESTINATION)
8'X 8'X 20 R	LACH (BEACH) 10K FORKLIFT (DESTINATION)
8'X 8'X 10'R	LACH (BEACH) 10K FORKLIFT (DESTINATION)
8'X 8'X 20'KD	LACH (BEACH) 30 TON CRANE (DESTINATION)
FLATRACKS–20'	LACH (BEACH) 10K FORKLIFT (DESTINATION)
FLATRACKS–40'	ELEVATED CAUSEWAY 30 TON CRANE (DESTINATION)
SERVICE SPT. MODULES	LACH (BEACH) 10K FORKLIFT (DESTINATION)

Table 8-14 is a listing of the motor transport equipment required in the simulation runs, with load sizes shown in parentheses.

The final step in over-the-shore operations required the determination of times to be used. Table 8-15 shows MHE cycle times for each item and :able 8-16 indicates transport times between areas, which was used for the simulation.

Table 8-14. Transporter Requirements by Cargo Type

CARGO TYPE	MHE
PALLET	6K FORKLIFT (BEACH) 4K FORKLIFT (DESTINATION)
PALCON	6K FORKLIFT (BEACH) 4K FORKLIFT (DESTINATION)
8-PAC	10K FORKLIFT
QUADCON	10K FORKLIFT
4-PAC	LACH (BEACH) 30 TON CRANE (DESTINATION)
CONTAINER	LACH (BEACH) 30 TON CRANE (DESTINATION)
8'X 8'X 20 R	LACH (BEACH) 10K FORKLIFT (DESTINATION)
8'X 8'X 10' R	LACH (BEACH) 10K FORKLIFT (DESTINATION)
8'X 8'X 20' KD	LACH (BEACH) 30 TON CRANE (DESTINATION)
FLATRACKS–20'	LACH (BEACH) 10K FORKLIFT (DESTINATION)
FLATRACKS–40'	ELEVATED CAUSEWAY 30 TON CRANE (DESTINATION)
SERVICE SPT. MODULES	LACH (BEACH) 10K FORKLIFT (DESTINATION)

Table 8-15. MHE Cycle Times (in minutes)

	PALLET	PALCON	8-PAC	QUADCON	4-PAC	CONTAINER	8'x 8'x 20' R	8'x 8'x 10' R	8'x 8'x 20' KD	FLATRACKS – 20'	FLATRACKS – 40'	SERVICE SPT. MODULE
30T CRANE					5	5			4		4	
LACH					6	6	6	6	6	6	6	6
10K FKLIFT			4	3			4	4		4		4
4K FKLIFT	2	2										
6K FKLIFT	2	2										
CONTAINER HANDLER					2	2			2		2	

Table 8-16. Times Between Destinations (in minutes)

		LOCATION										
		1	2	3	4	5	6	7	8	9	10	11
TRANSPORT AREA	1		15	15	15	15						
GREEN BEACH # 2	2	15					5		10	10	10	25
GREEN BEACH # 2	3	15					5		10	10	10	25
RED BEACH # 1	4	15						5	10	10	10	25
RED BEACH # 2	5	15						5	10	10	10	25
BSA # 1	6		5	5					5	5	5	20
BSA # 2	7				5	5			5	5	5	20
CSSA	8		10	10	10	10	5	5		5	5	15
EAF	9		10	10	10	10	5	5	5		5	15
HDQTRS	10		10	10	10	10	5	5	5	5		15
FORWARD AREA	11		25	25	25	25	20	20	15	15	15	

8.4.13 Simulation Model

The simulation was programmed to determine, over time, the status of the system's operation. Offloading was assumed to take place on a priority basis, with priority for landing craft service as follows:

- LPD
- LHA
- LKA
- LSD
- BBK
- NSSC

For example, during the ship offloading phase of the simulations, available landing craft will serve an LPD before an LHA, etc. Landing craft are prioritized as well. If both LCUs and LCM-8s are available, LCUs will be used first.

LSTs are not offloaded until floating causeways are available. There are four floating causeways, and their availability has been scheduled at H+6, H+9, H+14, and H+25 hours. Two elevated causeways are available at H+96 to provide container offloading capability. AFOE offloading operations were begun at H+100, the start of the sixth day of the assault.

8.4.14 FLS Model Execution

Simulations were performed using the data and logic explained above. The results of these runs can be summarized as follows:

- FLS provides the necessary logistic support to maintain optimum throughput for the AE and AFOE.
- All AE cargo can be transported to pertinent land destinations from shipping in less than 40 hours.
- Container offloading operations take 9 days.
- Limiting factors in the AFOE offloading operation are TCDF quantities.

These results can be seen in the following data. Table 8-17 lists the elapsed time (in hours) for ships to complete offloading. Table 8-18 shows the times at which all cargos, by element type, were delivered to their final destinations in the AOA.

Table 8-17. Ship Offloading Completion Times (hours)

No.	LPD	LST	LHA	LKA	LSD	LPH	BBK	NSSC
1	37.8	8.2	33.2	18.1	6.9	26.4	104.7	145.3
2	37.8	10.4	33.7	18.2	7.3	26.4	104.3	145.3
3	37.8	12.6	33.3	17.0	7.3	26.4	104.5	145.3
4	37.8	14.8	33.5	18.1	7.3	26.4	104.9	189.4
5	37.8	11.2	33.2	0.0	7.1	26.4	104.9	189.4
6	37.8	13.4	0.0	0.0	7.3	26.5	104.9	189.4
7	37.8	15.6	0.0	0.0	7.3	0.0	104.9	231.5
8	37.8	17.8	0.0	0.0	6.9	0.0	104.9	231.0
9	37.8	16.2	0.0	0.0	7.3	0.0	104.9	231.5
10	37.8	18.4	0.0	0.0	7.3	0.0	104.9	274.6
11	37.8	20.6	0.0	0.0	7.5	0.0	0.0	274.6
12	37.8	22.8	0.0	0.0	0.0	0.0	0.0	274.6
13	37.8	27.9	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	30.1	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	32.3	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	34.5	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	36.7	0.0	0.0	0.0	0.0	0.0	0.0

Table 8-18. Times At Which Cargo Was Completely Delivered

Cargo	Time (Hours)
Pallets	39.6
PALCONS	35.2
Eight-Packs	16.2
QUADCONs	19.7
Four-Packs of QUADCONs	235.5
Containers	257.9
8'x8'x20' Rigid	263.2
8'x8'x10' Rigid	265.4
8'x8'x20' Knockdown	266.0
20-Foot Flatracks	275.4
40-Foot Flatracks	276.0
Service Support Modules	263.2

Figures 8-2 through 8-17 indicate the total cargo delivered by time (in 20-hour days) and the quantities of equipment involved in the operation by period of time. Finally, table 8-19 is a summary of equipment utilization for the entire operation. These utilization quantities are compared to the II MAF allowance to indicate the magnitude of equipment issued versus its MAF utilization. Although the utilization quantities of figures 8-2 through 8-17 represent the equipment required to sustain maximum throughput, no attempt has been made to determine what amount of the II MAF allowance would actually be made available for this operation. Also, it must be reiterated that this model assumes no breakdowns or slowdowns of the equipment.

This data indicated that, even accepting the ideal offloading conditions under which this simulation was performed, an MHE and transporter reserve capacity should exist.

8.4.15 <u>Simulation of the Existing Logistic System</u>

In order to accomplish the system effectiveness comparison, the present logistic system was also simulated. For this operation, all of the cargo requirements for the MAF were converted into pallet equivalents. This consisted of:

	AE	AFOE
Pallets	40,248	134,992

All cargo transporters were averaged. A total of 1,595 cargo carriers were identified with an average carrying capacity of 4 pallets each and an average cost of $58,000 each.

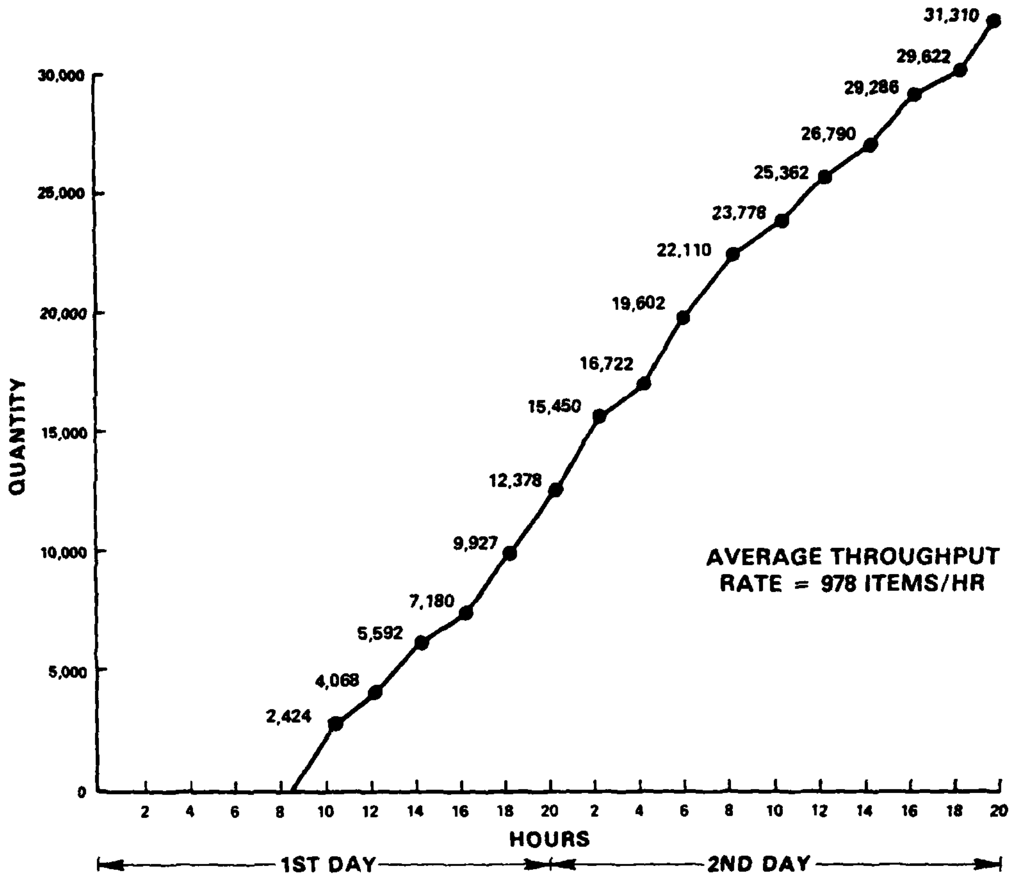


Figure 8-2. Pallet and PALCON Throughput

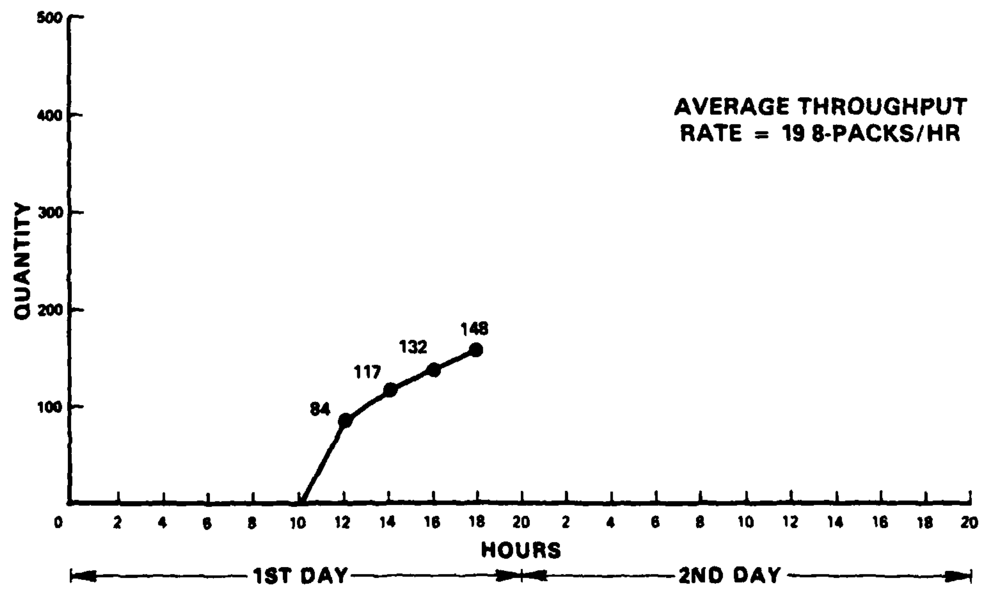


Figure 8-3. PALCON Eight-Pack Throughput

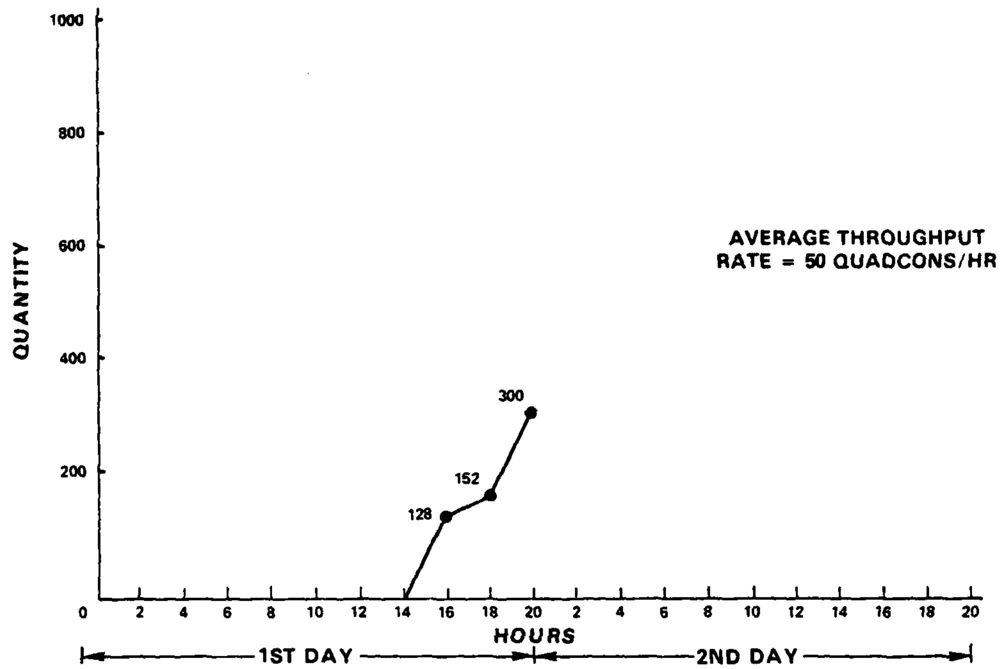


Figure 8-4. QUADCON Throughput

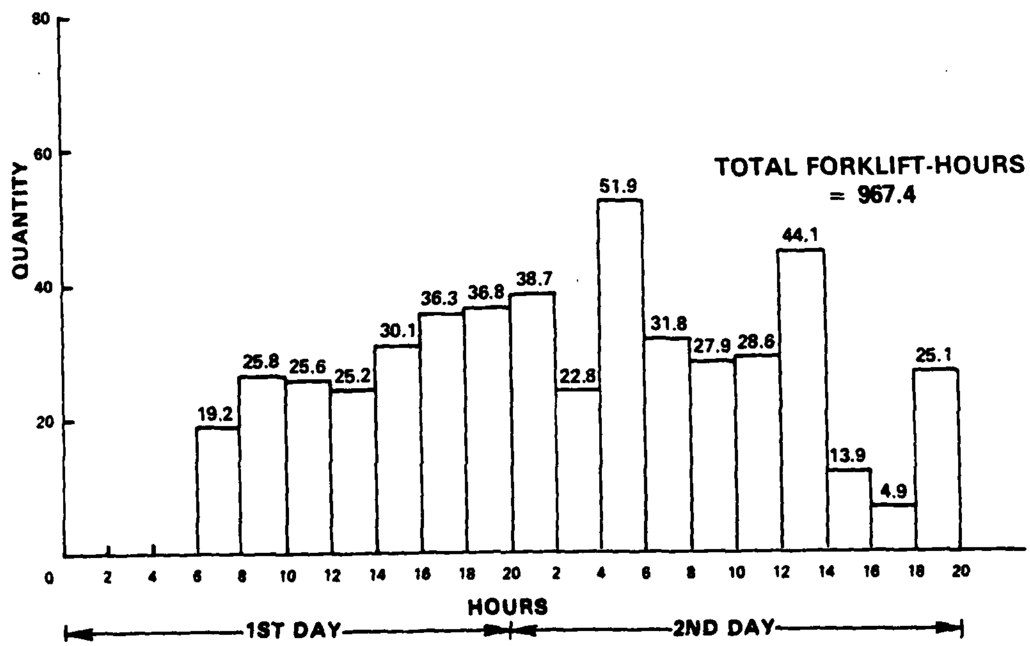


Figure 8-5. 6,000-Pound Forklift Utilization

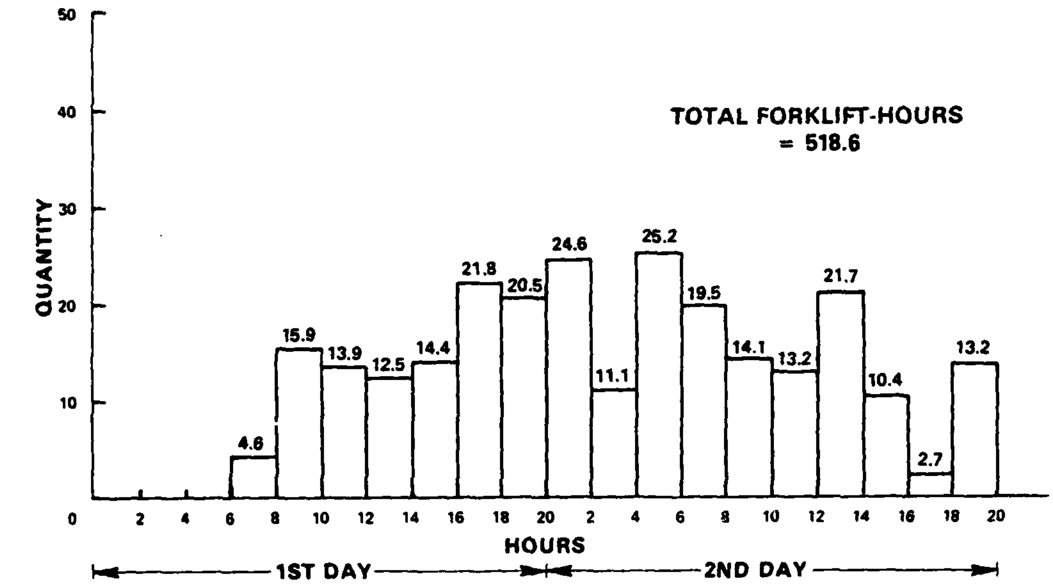


Figure 8-6. 4,000-Pound Forklift Utilization

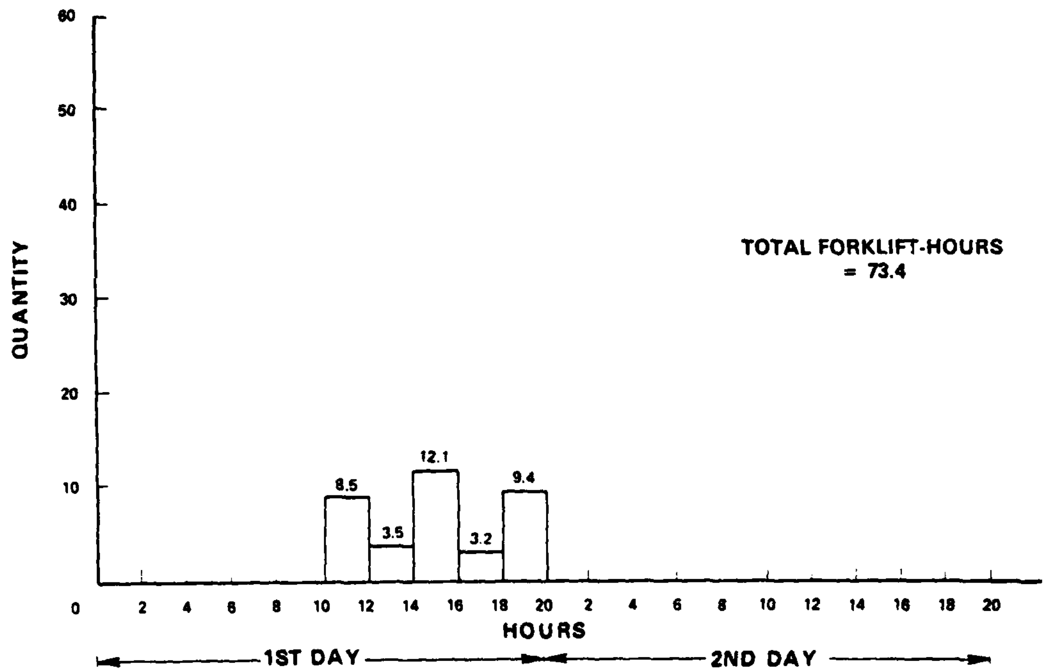


Figure 8-7. 10,000-Pound Forklift Utilization

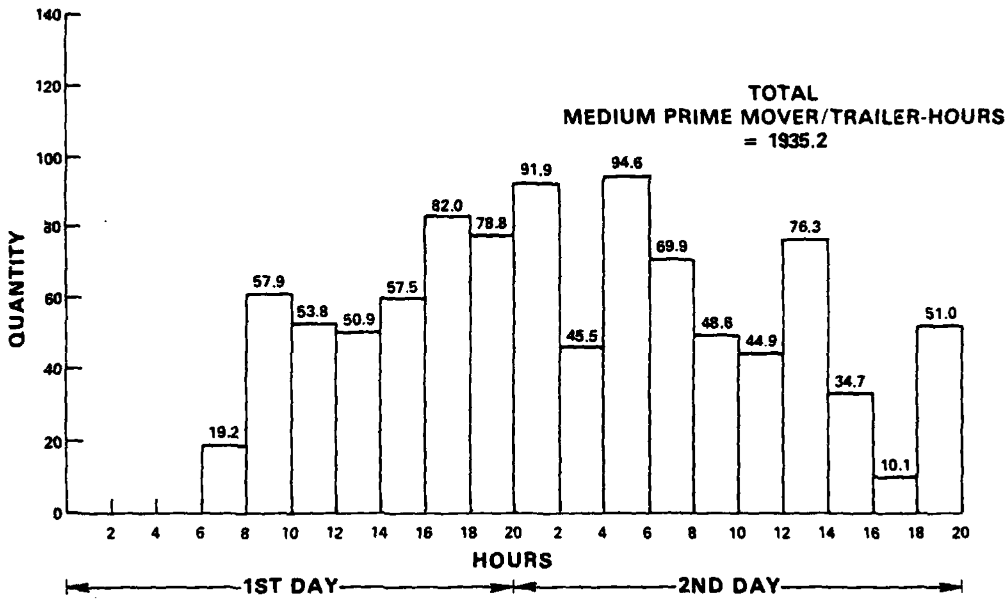


Figure 8-8. Medium Prime Mover/12½-Ton Trailer Utilization

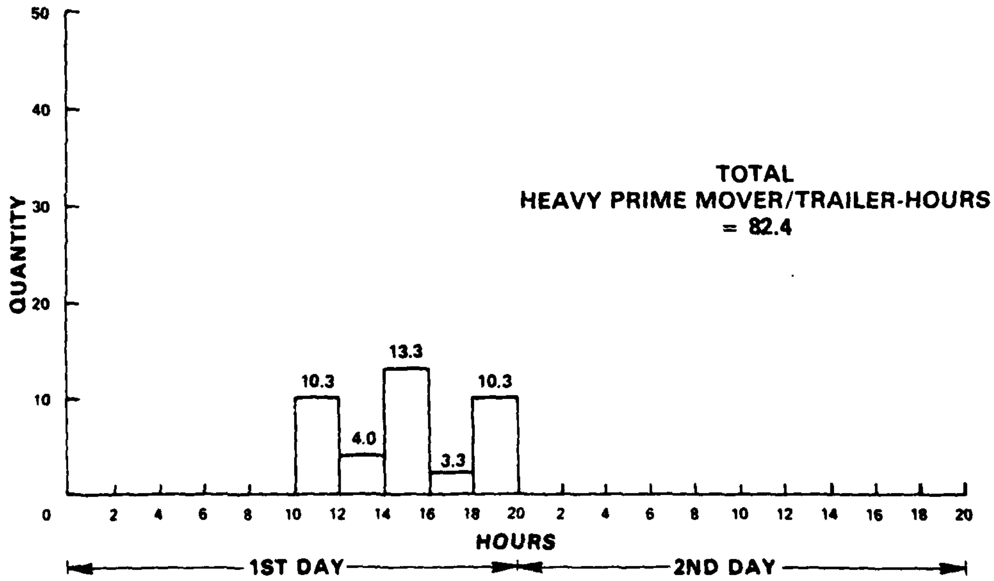


Figure 8-9. Heavy Prime Mover/22½-Ton Trailer Utilization

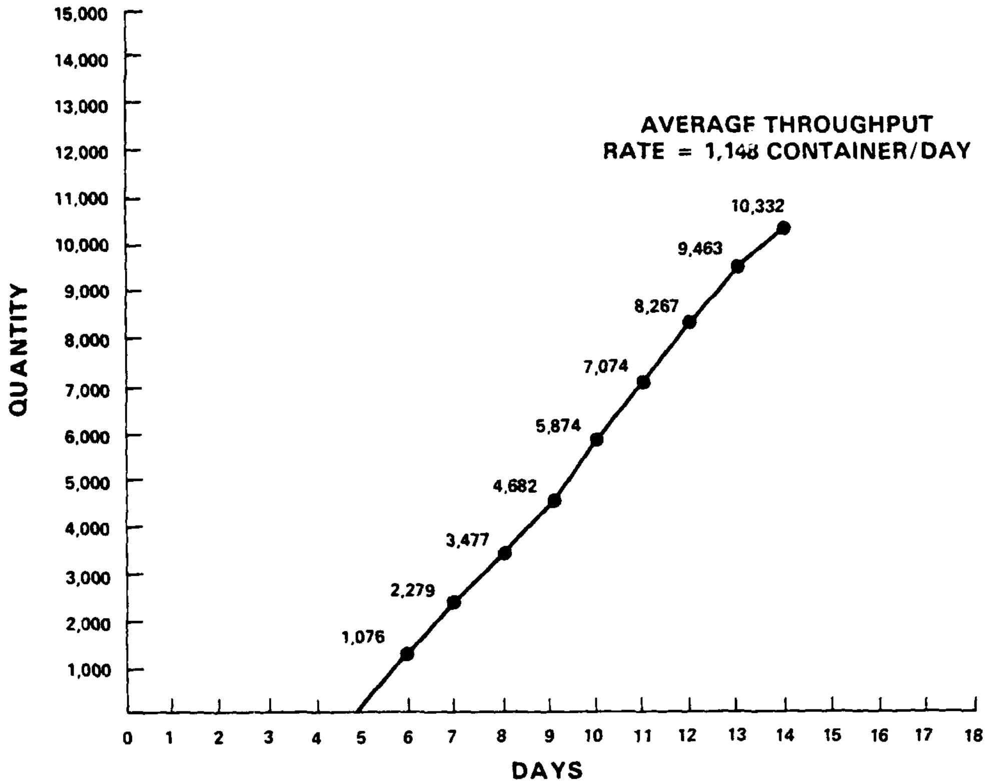


Figure 8-10. Container Throughput

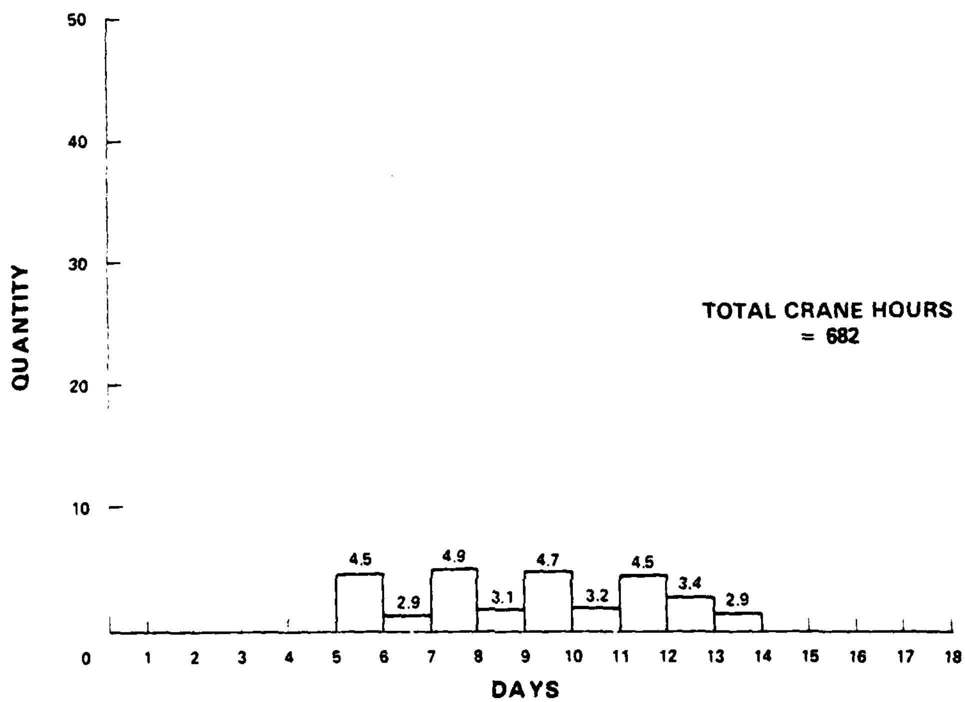


Figure 8-11. 30-Ton Crane Utilization

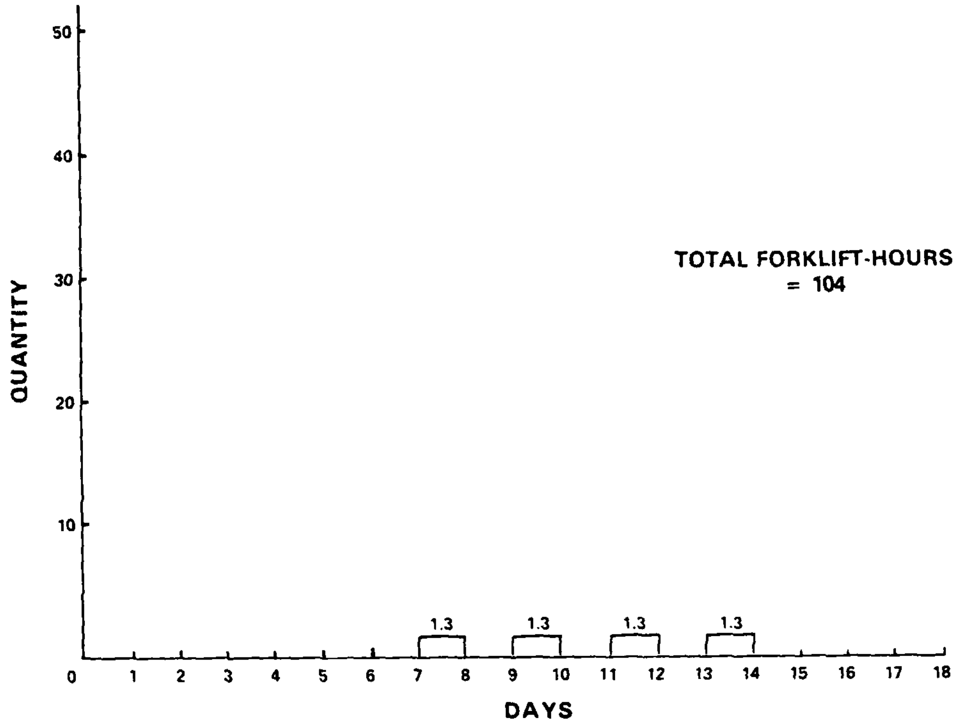


Figure 8-12. Forklift Utilization

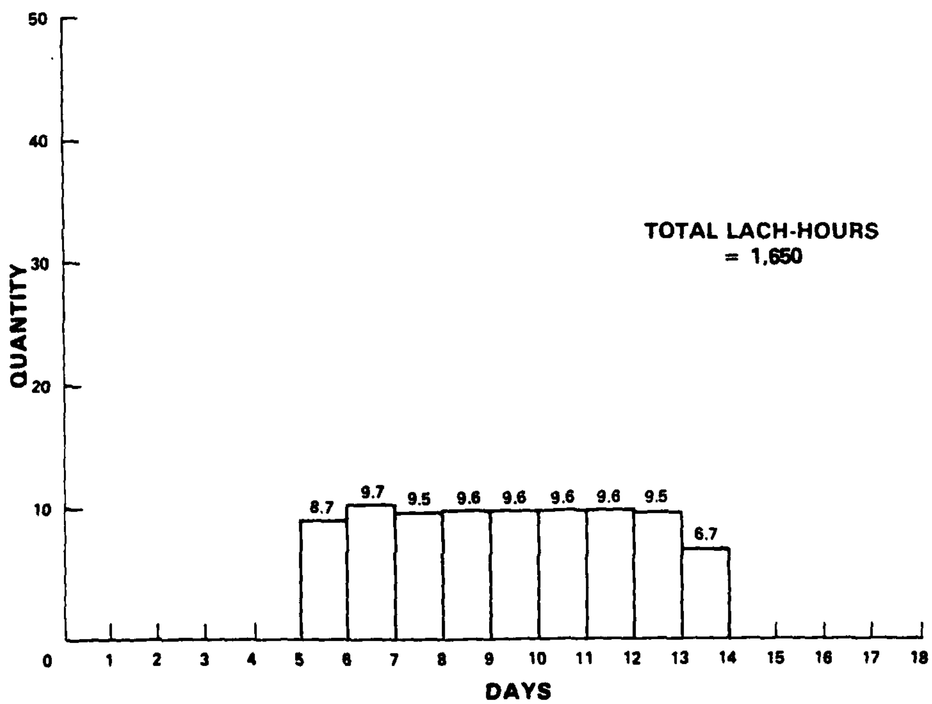


Figure 8-13. LACH Utilization

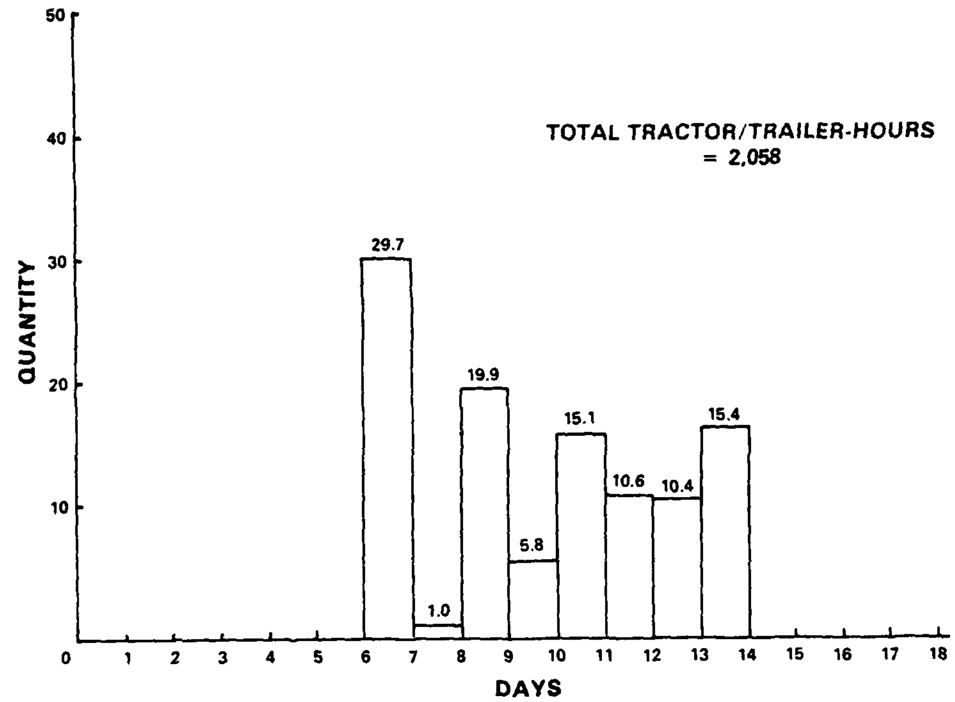


Figure 8-14. Medium Prime Mover/12½-Ton Trailer Utilization

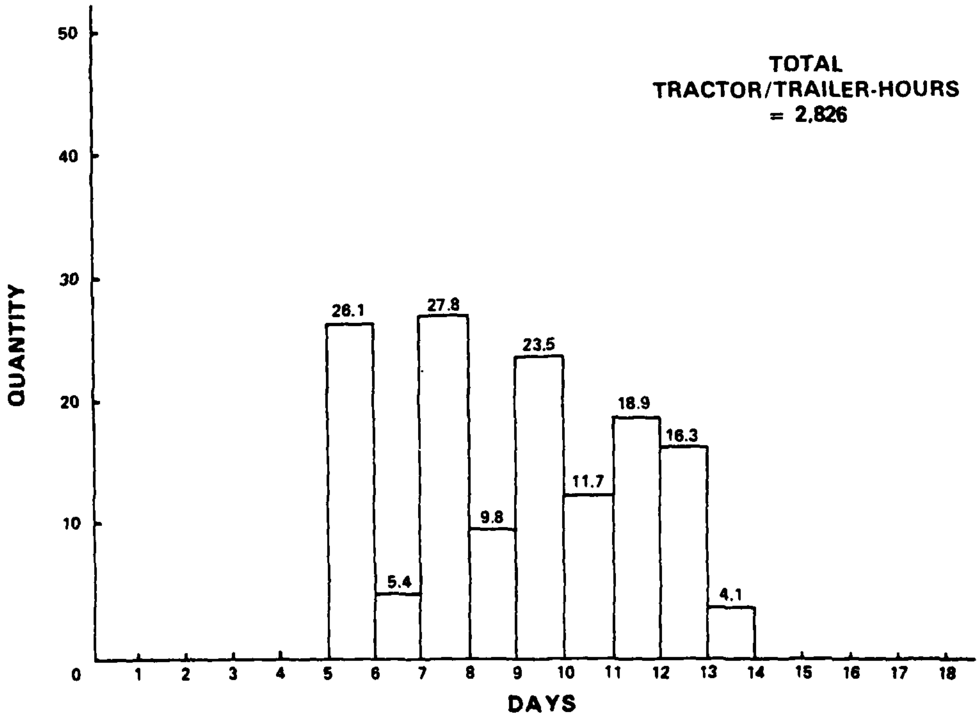


Figure 8-15. Heavy Prime Mover/22½-Ton Trailer Utilization

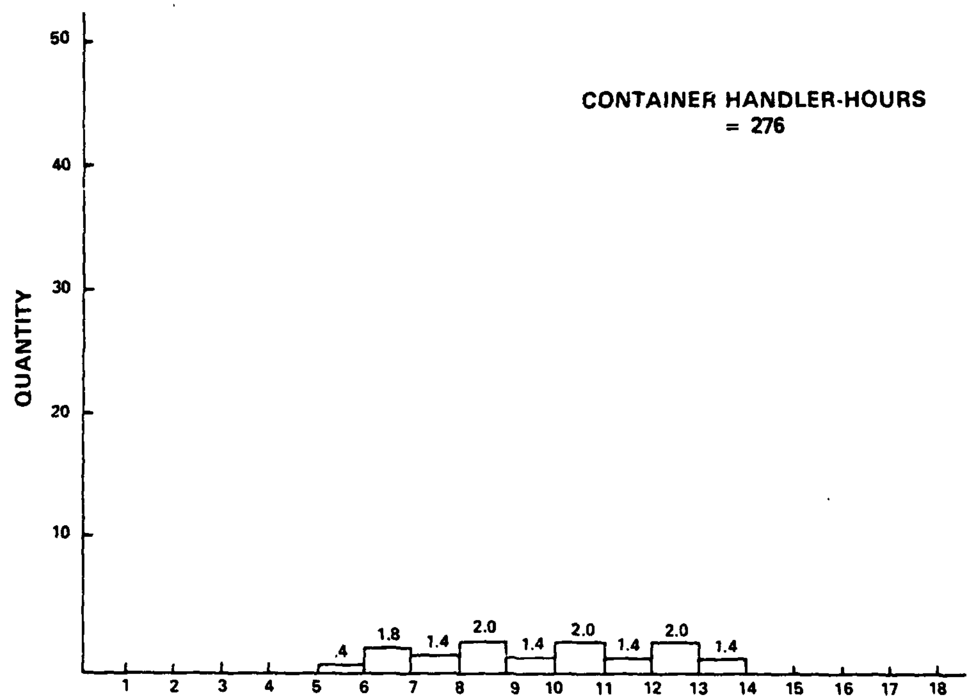


Figure 8-16. Container Handler

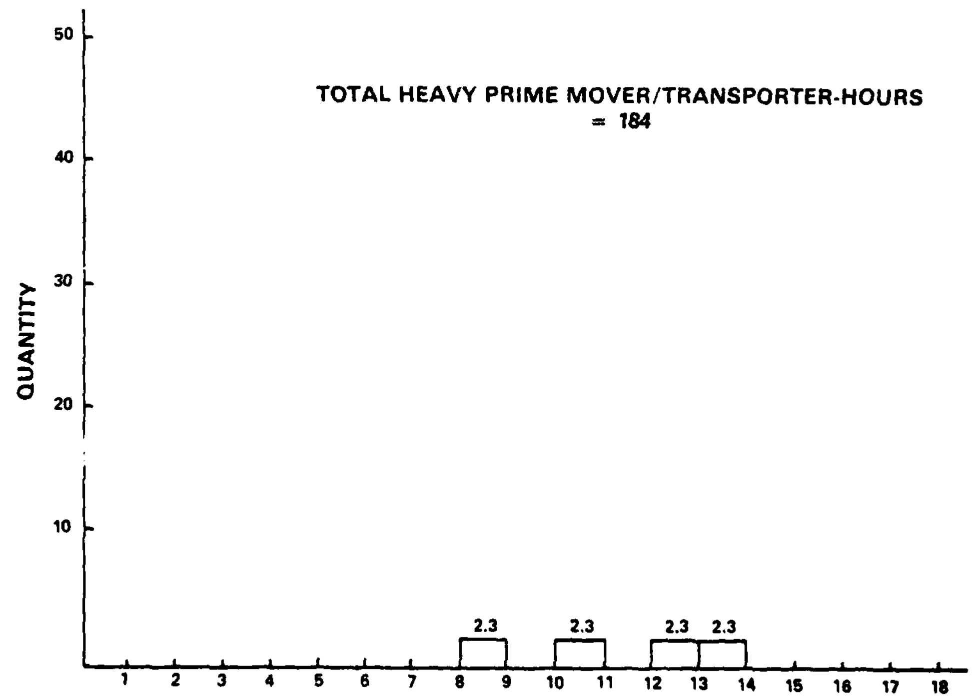


Figure 8-17. Heavy Prime ..over/Mobilizer/Transporter

Only 4,000- and 6,000-pound forklifts were used to handle the pallets. The 6,000-pound forklifts were used on the beach and the 4,000-pound forklifts were used at the AOA destinations.

The objective of this simulation was to determine the amount of equipment required to provide the same throughput rate as FLS. The data for this run was then compared with the FLS data reflected in table 8-19. The comparative results are shown in table 8-20.

Table 8-19. Equipment Analysis

Transporters and MHE	II MAF I/O	Peak
2-HOUR INTERVALS (AE–D+1, D+2)		
4,000-Pound Forklift	87	25.2
6,000-Pound Forklift	122	44.1
10,000-Pound Forklift	78	12.1
Medium Prime Mover	129	94.6
12½-Ton Trailer	237	94.6
Heavy Prime Mover	120	13.3
22½-Ton Trailer	173	13.3
1-DAY INTERVALS (AFOE–D+5 to D+14)		
30-Ton Crane (Container Handler)	37(5)	4.9(2)
LACH	14	9.6
10,000-Pound Forklift	78	1.3
Medium Prime Mover	129	24.7
12½-Ton Trailer	237	24.7
Heavy Prime Mover	120	27.8
22½-Ton Trailer	173	27.8
Mobilizer/Transporter	4	2.3

Table 8-20. Throughput Equipment Comparison

Item	Peak 2-Hour or 1-Day Average	Unit Cost	Total Cost Per Item
FLS EQUIPMENT			
4,000-Pound Forklift	25.2	$ 43,000	$ 1,083,600
6,000-Pound Forklift	44.1	77,600	3,422,160
10,000-Pound Forklift	12.1	125,400	1,517,340
30-Ton Crane	4.9	179,200	878,080
LACH	9.6	108,900	1,045,440
Medium Prime Mover	94.6	58,800	5,562,480
12½-Ton Trailer	94.6	13,600	1,286,560
Heavy Prime Mover	27.8	100,000	2,780,000
22½-Ton Trailer	27.8	18,900	525,420
Mobilizer/Transporter	2.3	15,000	34,500
Total			$18,135,580

Table 8-20. Throughput Equipment Comparison—Continued

Item	Peak 2-Hour or 1-Day Average	Unit Cost	Total Cost Per Item
	EXISTING EQUIPMENT		
4,000-Pound Forklift	31.5	$ 43,000	$ 1,354,500
6,000-Pound Forklift	62.3	77,600	4,834,480
Trucks	202.1	58,000	11,721,800
Total			$17,910,780

8.4.16 System Effectiveness (Cost)

Using the peak 2-hour or 1-day averages from table 8-20, multiplying these quantities by the unit cost and summing, a total cost for equipment required to perform the operation is obtained. FLS shows an increase of 1 percent in equipment costs compared to present breakbulk operations to provide the same supply support. Using the container handler in place of the 30-ton crane reduces FLS equipment costs by $360,810.

8.4.17 Manpower Requirements

As part of the simulations of FLS and the existing logistic system operations, total hours of equipment use for these operations were computed. Since each piece of equipment requires a certain number of men to effectively perform the operation, this equipment use can be converted into man-hours. Table 8-21 indicates the total man-hour requirements for both FLS and the existing logistic system. Based on this analysis, FLS reduces manpower requirements for cargo offloading operations by 41 percent. Using the container handler in place of the 30-ton crane reduces FLS manpower requirements by an additional 1,770 hours.

Table 8-21. Manpower Requirements

Item	Total Hours In Use	Manpower Factor	Man-hours
	FLS EQUIPMENT		
4,000-Pound Forklift	519	2	1,038
6,000-Pound Forklift	967	2	1,934
10,000-Pound Forklift	177	2	354
30-Ton Crane	682	3	2,046
LACH	1,650	4	6,600
Medium Prime Mover	3,993	2	7,986
12½-Ton Trailer	3,993	-	-
Heavy Prime Mover	3,092	2	6,184
22½-Ton Trailer	2,906	-	-
Mobilizer/Transporter	184	-	-
Total			26,142

Table 8-21. Manpower Requirements—Continued

Item	Total Hours In Use	Manpower Factor	Man-hours
EXISTING EQUIPMENT			
4,000-Pound Forklift	2,740	2	5,480
6,000-Pound Forklift	5,458	2	10,916
Trucks	18,753	1.5	28,130
Total			44,526

8.4.18 Conclusion Based on Model Simulation

The results of the simulation show FLS to be the more advantageous choice from a system-effectiveness point of view. Assuming that all cargo could be palletized, there would be 175,240 pallets in the MAF lift requirement. The present inventory of material handling and motor transport equipment could transfer the 60-day supply block of the AE and AFOE over the beach to first destinations within the same time frame as FLS, which is approximately 14 days. This is based on an optimal performance by all offloading-related equipment.

However, FLS has a decided edge in terms of manpower and landing craft requirements. Although FLS equipment costs are 1 percent greater than existing equipment, table 8-21 shows that FLS requires slightly less than 60 percent of the manpower that is presently necessary, which is extremely cost significant. This is clearly a result of moving fewer unit loads. Two men with the proper equipment can move one container considerably faster than they can move 24 pallets. For this same reason, there is also a sizable reduction in the number of landing craft required to maintain a given throughput rate with FLS. Sustaining a throughput rate of approximately 44,000 tons per day for the AFOE requires more than twice the number of FLS support landing craft when using the present logistic system. In addition and perhaps most significant, the present logistic support capability cannot efficiently interface with 20-foot containers.

Another factor which favors FLS is the ability of containerships to reach the objective area faster than the breakbulk ships. Coupled with the reduction in square stowage requirements by the AE and the reduction in manpower support, this means FLS can provide the requisite combat support supplies faster via amphibious ships and containerships.

As depicted in table 8-21, FLS requires a greater number of equipment types. This is because three sizes of cargo loads are being transported, i.e., PALCONs/pallets, QUADCONs, and the commercial 8'x8'x20' containers.

Factors of a MAF assault operation beyond initial buildup have not been analyzed as part of this study. These include warehousing operations, unstuffing operations, and retrograde of containers.

Warehousing aspects of a MAF-size operation include consideration of shelter versus field warehousing, arrangement, and accessibility. When considering follow-on supplies, approximately 150,000 pallets are involved. FLS would containerize these, and this in itself may be adequate environmental protection. A comparison of storage requirements and access for approximately 6,000 containers versus 150,000 pallets warrants a detailed analysis.

With regard to unstuffing, there is not enough data at present to conclude that transferring pallets from a container to a transporter requires more time than moving the pallets from a supply warehouse, or marshalling yard, onto a trailer. For the MAF assault, it is assumed that all AFOE supplies will initially be marshalled prior to distribution to the user, regardless of whether the supplies are palletized or in containers. However, factors beyond the scope of this throughput model impact such a comparison. The most critical variables are container packing technique, content identification, marshalling yard layout, and supply demand.

In addition, the simulation model provides for direct throughput of all containerized supplies to the CSSA. The possibility exists, as noted in the Logistics Concept of Operation for the FLS (appendix E to this plan), that intermediate BSA storage may be required. This would increase equipment operating times for FLS throughput. For comparative purposes, however, similar throughput procedures would be required for breakbulk cargo, thereby increasing the operating times for current equipment.

Container retrograde operations were also beyond the scope of this throughput analysis since determination of when retrograde would begin is also a factor of the above. Three points must be considered in an analysis of retrograde. First, a determination must be made based on consumption factors and warehousing techniques, when retrograde will begin. For this study, it was assumed that retrograde does not begin until general resupply operations commence. Secondly, since retrograde complements supply operations by cycling back trailers and landing craft to supply points, empty shipping containers can also be recycled simultaneously. However, a detailed analysis of the planned operational procedures is necessary to project additional equipment requirements for that function. Thirdly, if retrograde does not begin until resupply (and this is scenario-dependent), the important consideration becomes how container offloading with simultaneous retrograde operations compares to general palletized resupply operations.

These factors should be analyzed to provide a thorough understanding of FLS operations as well as to determine the total cost-effectiveness of FLS compared to present logistics operations. However, in view of the over-the-beach analysis and the current severely limited capability to perform container handling operations, FLS offers a greater capability than the existing logistics system, as explained in section 8.1.

8.5 IMPACT OF FLS ON MARINE AMPHIBIOUS UNIT (MAU) LOADING PLANS

An analysis of loading plans for a typical MAU operation was undertaken to determine how the introduction of FLS equipment would impact upon operational capability. The areas investigated in this initial effort involved the motor transport, shelter, service support, and material handling subsystems of FLS. The objectives were to:

- Determine if FLS motor transport equipment would provide cargo-carrying capability equal to or greater than the equipment being replaced.
- Determine if the ships involved in the operation would provide adequate stowage capacity for FLS equipment.
- Identify any shelters and/or modules required to replace current equipment in the operation.
- Evaluate the capability to stow and handle shelters and/or modules in amphibious ships, offload them, remove them from lighterage at the beach, and transport/transfer them in the AOA.

To accomplish these objectives, a set of modified ship loading plans for a MAU-size operation was developed. Existing loading plans for a typical operation were obtained from the Plans and Policies Branch, HQMC (Code LPP). In this case, the MAU shipping consisted of one LSD, one LPH, one LPD, and two LSTs.

Loading plans were used to identify the MAU's existing equipment on each ship. Following this, the CVM Analysis was utilized to determine the replacement equipment by type, quantity, and unit for each ship engaged in the operation. The results of this phase of the analysis are shown in tables 8-22 through 8-26. These tables contain the equipment and the planned FLS replacement equipment by ship.

8.5.1 Analysis of Cargo-Carrying Capacity and Stowage Requirements

Tables 8-27 through 8-31 show the capacities and deck space requirements for the existing and FLS equipment by ship.

The tables indicate that in all cases more cargo-carrying capacity results from the FLS vehicles. In three cases, the IWO JIMA (LPH-2), the PLYMOUTH ROCK (LSD-29), and the FAIRFAX COUNTY (LST-1193), the deck space required for the FLS equipment exceeds that of the existing equipment to be replaced. In each of these three cases, however, the total deck square required for the FLS equipment, plus other equipment requiring square

Table 8-22. USS TRENTON (LPD-14) Existing Equipment/FLS Equipment Replacement Schedule

	Existing Equipment		FLS Replacement	
TAM #	Description	Qty.	Description	Qty.
A2340	Hop. AN/GRM 32	1	Expeditionary shelter	1
B2465	Trac. arts. w/fk., 10-ton	1	10,000-pound, forklift (mod.)	1
B2565	Trk. fklft., 4,000-lb.	1	4,000-pound forklift (mod.)	1
D0090	Cleaner steam	1	Module to be developed	
D0840	Trlr. car, M416B, $\frac{1}{4}$-ton	8	Requirements satisfied with D1160	0
D0850	Trlr. car, M101, 3/4-ton	1	Requirements satisfied with D1160	0
D0860	Trlr. car, M105, $1\frac{1}{2}$-ton	3	Trlr, $12\frac{1}{2}$-ton	1
D0880	Trlr. tnk., wtr., M149, 400-gal.	2	Water module, 1,000-gal.	2
D0915	Trk. amb., M886, $1\frac{1}{4}$-ton	1	Trk., 5/4-ton, HMMWV	1
D1020	Trk. car, M561, $1\frac{1}{4}$-ton	2	Trk., 5/4-ton, HMMWV	2
D1030	Trk. car, M35A2C, $2\frac{1}{2}$-ton	9	Trk., 5-ton, cargo, HHMTT	9
D1050	Trk. car, M54A2C, 5-ton	1	Trk., 5-ton, cargo, HHMTT	1
D1160	Trk. util., M151A1, $\frac{1}{4}$-ton	13	Trk., 5/4-ton, HMMWV	13
D1190	Van, M109A3, trlr.-mtd., $2\frac{1}{2}$-ton	1	Expeditionary shelter	1
D1210	Trk. wrkr., M543A2, 5-ton	1	Wrkr., 5-ton	1

Table 8-23. USS IWO JIMA (LPH-2) Existing Equipment/FLS Equipment Replacement Schedule

	—Existing Equipment—		—FLS Replacement—	
TAM #	Description	Qty.	Description	Qty.
D0840	Trlr. car, M416B, ¼-ton	14	Requirements satisfied with D1160	0
D0875	Trlr. fltbd., M762, 3/4-ton	1	Requirements satisfied with D1160	0
D1020	Trk. car, M561, 1¼-ton	3	Trk., 5/4-ton, HMMWV	3
D1160	Trk. util., M151A1, ¼-ton	24	Trk., 5/4-ton, HMMWV	24

Table 8-24. USS PLYMOUTH ROCK (LSD-29) Existing Equipment/FLS Equipment Replacement Schedule

	—Existing Equipment—		—FLS Replacement—	
TAM #	Description	Qty.	Description	Qty.
D0840	Trlr. car, M416B, ¼-ton	3	Requirements satisfied with D1160	0
D0860	Trlr. car, M105, 1½-ton	1	Trlr., 12½-ton	1
D1050	Trk. car, M54A2, 5-ton	1	Trk., 5-ton, cargo, HHMTT	1
D1155	Trk. guid. msl., ¼-ton	4	Trk., 5/4-ton, HMMWV	4
D1156	Trk. msl. car, ¼-ton	2	Trk., 5/4-ton, HMMWV	2
D1160	Trk. util., M151A1, ¼-ton	3	Trk., 5/4-ton, HMMWV	3

Table 8-25. USS FAIRFAX COUNTY (LST-1193) Existing Equipment/FLS Equipment Replacement Schedule

	—Existing Equipment—		—FLS Replacement—	
TAM #	Description	Qty.	Description	Qty.
D0840	Trlr. car, M416B, ¼-ton	2	Requirements satisfied with D1160	0
D0860	Trlr. car, M105, 1½-ton	4	Trlr., 12½-ton	1
D0880	Trlr. tnk., wtr., M149	1	Water module	1
D1020	Trk. car, M561, 1¼-ton	2	Trk., 5/4-ton, HMMWV	2
D1030	Trk. car, M35A2C, 2½-ton	4	Trk., 5-ton, cargo,HHMTT	4
D1155	Trk. guid. msl., ¼-ton	4	Trk., 5/4-ton, HMMWV	4
D1156	Trk. msl. car, ¼-ton	2	Trk., 5/4-ton, HMMWV	2
D1160	Trk. util., M151A1, ¼-ton	3	Trk., 5/4-ton, HMMWV	3

Table 8-26. USS BOULDER (LST-1190) Existing Equipment/FLS Equipment Replacement Schedule

TAM #	Existing Equipment Description	Qty.	FLS Replacement Description	Qty.
D0260	Semi-trlr., 12-ton, tk.	1	Trlr., $22\frac{1}{2}$-ton	1
D0840	Trlr. car, M416B, $\frac{1}{4}$-ton	4	Requirements satisfied with D1160	0
D0860	Trlr. car, M105, $1\frac{1}{2}$-ton	10	Trlr., $12\frac{1}{2}$-ton	2
D0880	Trlr. tnk., wtr., M149, 400-gal.	5	Water module, 1,000-gal.	5
D0890	Trk. amb., M718, $\frac{1}{4}$-ton	1	Trk., 5/4-ton, HMMWV	1
D0915	Trk. amb., M886, $1\frac{1}{4}$-ton	1	Trk., 5/4-ton, HMMWV	1
D1020	Trk. car, M561, $1\frac{1}{4}$-ton	1	Trk. 5/4-ton, HMMWV	1
D1030	Trk. car, M35A2, $2\frac{1}{2}$-ton	18	Trk., 5-ton, cargo, HHMTT	18
D1050	Trk. car, M54A2C, 5-ton	3	Trk., 5-ton, cargo, HHMTT	3
D1130	Trk. Trac., M52A2, 5-ton	1	Heavy prime mover	1
D1160	Trk. util., M151A1, $\frac{1}{4}$-ton	5	Trk., 5/4-ton, HMMTT	5
D1210	Trk. wrkr., 543A2, 5-ton	2	Wrkr., 5-ton	1

Table 8-27. USS TRENTON (LPD-14) Existing Equipment/FLS Square Stowage Capabilities and Requirements

	Existing					FLS			
		Total Cargo Capacity		Required Deck Space			Total Cargo Capacity		Required Deck Space
TAM #	Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)		Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)
A2340	1	--	--	193	Expeditionary shelter	1	--	--	160
B2465	1	--	--	202	10,000-*pound* fklft. (mod.)	1	--	--	202
B2565	1	--	--	57	4,000-*pound* fklft. (mod.)	1	--	--	122
D0090	1	--	--	39	Steam cleaner	–*Module to be developed*–			160
D0840	8	164	243	384	Requirements satisfied with D1160				
D0850	1	35	140	78	Requirements satisfied with D1160				
D0860	3	162	810	366	Trlr., 12½-ton	1	160.0	1,280.0	160
D0880	2	--	--	186	Water module	2	--	--	108
D0915	1	52	258	122	Trk., 5/4-ton, HMMWV	1	34.2	102.6	112
D1020	2	72	336	266	Trk., 5/4-ton, HMMWV	2	68.4	205.2	224
D1030	9	765	9,104	1,593	Trk., 5-ton, cargo, HHMTT	9	1,035.0	4,554.0	1,629
D1050	1	102	511	203	Trk., 5-ton, cargo, HHMTT	1	115.0	506.0	181
D1160	13	104	156	780	Trk., 5/4-ton, HMMWV	13	444.6	1,333.8	1,456
D1190	1	--	--	180	Expeditionary shelter	1	--	--	160
D1210	1	--	--	242	Wrkr., 5-ton	1	--	--	181
Total		1,456	11,558	4,891			1,857.2	7,981.6	4,855

Table 8-28. USS IWO JIMA (LPH-2) Existing Equipment/FLS Square Stowage Capabilities and Requirements

	Existing					FLS			
		Total Cargo Capacity		Required Deck Space			Total Cargo Capacity		Required Deck Space
TAM #	Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)		Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)
D0840	14	287	434	672	Requirements satisfied with D1160				
D0875	1	20	--	45	Requirements satisfied with D1160				
D1020	3	108	504	399	Trk., 5/4-ton, HMMWV	3	102.6	307.8	336
D1160 w/radio	10	80	120	699	Trk., 5/4-ton, HMMWV	10	342.0	1,026.0	1,120
D1160 w/o radio	14	112	168	840	Trk., 5/4-ton, HMMWV	14	478.8	1,436.4	1,568
Total		607	1,226	2,655			923.4	2,770.2	3,024

Table 8-29. USS PLYMOUTH ROCK (LSD-29) Existing Equipment/FLS Square Stowage Capabilities and Requirements

	Existing					FLS			
		Total Cargo Capacity		Required Deck Space			Total Cargo Capacity		Required Deck Space
TAM #	Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)		Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)
D0840	3	615	93	135	Requirements satisfied with D1160				
D0860	1	54	270	122	Trlr., 12½-ton	1	160.0	1,280.0	160.0
D1050	1	102	511	203	Trk., 5-ton, cargo, HHMTT	1	115.0	506.0	181.0
D1155	4	--	--	272	Trk., 5/4-ton, HMMWV	4	136.8	410.4	448.0
D1156	2	--	--	120	Trk., 5/4-ton, HMMWV	2	68.4	205.2	224.0
D1160	3	24	180	180	Trk., 5/4-ton, HMMWV	3	102.6	307.8	336.0
Total		795	1,054	1,032			582.8	2,709.4	1,349.0

Table 8-30. USS FAIRFAX COUNTY (LST-1193) Existing Equipment/FLS Square Stowage Capabilities and Requirements

	Existing					FLS			
		Total Cargo Capacity		Required Deck Space			Total Cargo Capacity		Required Deck Space
TAM #	Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)		Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)
D0840	2	41.0	62	96	Requirements satisfied with D1160				
D0860	4	216.0	1,080	488	Trlr., 12½-ton	1	160.0	1,280.0	160
D0880	1	–400 gal.–		93	Water module	1	--	--	54
D1020	2	72.0	336	266	Trk., 5/4-ton, HMMWV	2	68.4	205.2	224
D1030	4	340.0	1,824	780	Trk., 5-ton, cargo, HHMTT	4	460.0	2,024.0	724
D1155	4	--	--	272	Trk., 5/4-ton, HMMWV	4	136.8	410.4	448
D1156	2	--	--	120	Trk., 5/4-ton, HMMWV	2	68.4	205.2	224
D1160	3	24.0	36	180	Trk., 5/4-ton, HMMWV	3	102.6	307.8	336
Total		693.0	3,338	2,295			996.2	4,432.6	2,170

Table 8-31. USS BOULDER (LST-1190) Existing Equipment/FLS Square Stowage Capabilities and Requirements

	Existing				FLS				
		Total Cargo Capacity		Required Deck Space			Total Cargo Capacity		Required Deck Space
TAM #	Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)		Qty.	(sq. ft.)	(cu. ft.)	(sq. ft.)
B2465	1	--	--	202	10,000-pound fklft. (mod.)	1	--	--	202
D0260	1	210	840	232	Trlr., 22½-ton	1	160.0	1,280.0	160
D0840	4	82	124	192	Requirements satisfied with D1160				
D0860	10	540	2,700	1,220	Trlr., 12½-ton	2	320.0	2,560.0	320
D0880	5	–400-gal. trlr.–		465	Water module	5	--	--	266
D0890	1	--	--	67	Trk., 5/4-ton, HMMWV	1	32.2	102.6	112
D0915	1	--	--	122	Trk., 5/4-ton, HMMWV	1	32.2	102.6	112
D1020	1	36	168	133	Trk., 5/4-ton, HMMWV	1	32.2	102.6	112
D1030	18	1,530	8,208	3,510	Trk., 5-ton, cargo, HHMTT	18	2,070.0	9,108.0	3,258
D1050	3	306	1,533	609	Trk., 5-ton, cargo, HHMTT	3	345.0	1,518.0	543
D1130	1	--	--	176	Heavy prime mover	1	--	--	--
D1160	5	40	60	300	Trk., 5/4-ton, HMMWV	15	161.0	513.0	560
D1210	1	--	--	242	Wrkr., 5-ton, cargo, HHMTT	1	--	--	181
Total		2,744	13,633	7,470			3,152.6	15,286.8	5,826

loading, is still within the available square footage cited in the SLCPs, plus a 20-percent broken stowage factor, as shown in table 8-32.

8.5.2 Analysis of Handling

Based on present FLS replacement plans, table 8-27 shows that two shelters, two water modules, and a steam cleaner module would be loaded in the TRENTON (LPD-14). There would also be one 12½-ton logistics trailer and one 10,000-pound forklift loaded in the TRENTON. With such a loadout, handling problems can be expected to arise due to the inability to move the shelters and modules.

If shelters are not trailer-mounted, they cannot be efficiently transported to the beach. There are a number of reasons for this, the most critical reason being that at the beach, there is no way to remove the shelters from the landing craft. The only item in the MAU capable of handling shelters is the 10,000-pound forklift; however, the maximum landing craft cargo-well width of 18 feet (LCU) prohibits loading shelters transversely, thus making it impossible for the forklift to make the required lift. In addition, lack of handling equipment and the 18-foot length of the cargo elevators on board the TRENTON require stowing the shelters on the flight deck if they are not trailer-mounted.

The steam cleaner and water module do not present any handling difficulties. Both can be lifted by the 10,000-pound forklift and transported by organic 5-ton trucks.

Of the remaining modules, one water module would be loaded in the FAIRFAX COUNTY (LST-1193). The water module must be preloaded on the one 5-ton truck included in the FAIRFAX COUNTY loading plan. The five remaining water modules would be loaded in the BOULDER (LST-1190) and require preloading on both 5-ton trucks and the 22½-ton logistics trailer.

Also worth noting, with respect to transporting shelters or supplies on logistics trailers, is the fact that, based on present replacement plans, only one prime mover is included in this MAU loadout. Should the future configuration of the logistics trailers result in a fifth-wheel design, either adapters or additional tractors will be required for a MAU operation.

8.5.3 QUADCONs

No effort was made in this initial analysis to determine how many QUADCONs would be involved in the MAU operation, nor to identify which ships would be required to transport them. However, discussions with Combat Cargo Officers indicate that QUADCONs cannot be stowed in cargo holds and cannot be handled by the organic MHE of the ships that would be involved in a MAU-size operation. For this reason, QUADCONs must be limited to that quantity which can be mobile-loaded. Since a 10,000-pound forklift is included in the loading plan, the capability exists to unload QUADCONs from trucks and trailers in the AOA.

Table 8-32. Amphibious Ships Usable Square Versus Required Square with FLS Equipment

Ship	Type	Broken Storage Factor		Available Vehicle Stowage (sq. ft.)		Usable Vehicle Stowage (sq. ft.)	Required Vehicle Stowage w/FLS (sq. ft.)
TRENTON	LPD	.80	x	13,910	=	11,128	7,575
IWO JIMA	LPH	.80	x	5,567	=	4,454	3,610
PLYMOUTH ROCK	LSD	.80	x	9,700	=	7,760	3,749
FAIRFAX COUNTY	LST	.80	x	24,095	=	19,276	6,725
BOULDER	LST	.80	x	24,095	=	19,276	12,038

8.5.4 Marine Amphibious Brigade (MAB) Loading Plans

A similar analysis was performed using a notional MAB loading plan received from HQMC (Code LPP).

The loading plans were analyzed with respect to replacing major end items with FLS shelters, motor transport, MHE, and service support items. As with the MAU, the MAB analysis focused on:

- Determining if FLS equipment provides a cargo-carrying capability equal to or greater than the equipment being replaced.
- Determining if the ships involved in the operation provide adequate stowage capacity for the FLS equipment.
- Identifying shelters and/or modules required to replace current equipment in operation.
- Evaluating the capability to stow and handle shelters and/or modules in amphibious ships, offload them, remove them from lighterage at the beach, and transport/transfer them in the AOA.

The results of this analysis were basically consistent with the analysis of a MAU operation with respect to the four objectives stated above. Table 8-33 is a summary of square and cube cargo capacity and required deck space for both the current equipment and the planned FLS replacement items.

Table 8-33. MAB Loading Plan Summary

EXISTING EQUIPMENT			FLS EQUIPMENT		
Total Cargo Capacity		Required Deck Space	Total Cargo Capacity		Required Deck Space
(sq. ft.)	(cu. ft.)	(sq. ft.)	(sq. ft.)	(cu. ft.)	(sq. ft.)
40,201	211,059	102,847	48,554	237,591	88,538

As can be seen in table 8-33, the FLS provides more cargo-carrying capacity while requiring considerably less deck space.

8.5.5 Conclusions

The analysis for typical MAU and MAB assault operations [illegible]tes the following:

- FLS equipment will provide more cargo-carrying capab[illegible]ty than the equipment which will be replaced.
- FLS equipment will not exceed present ship stowage capacities.
- Critical handling problems will be created if shelters, modules, and QUADCONs are not mobile loaded.
- An insufficient quantity of tractors are included in the MAU loading plans if trailers are a fifth-wheel design.
- As noted in section 8.4.5, clearance problems restrict mobile loaded shelters and QUADCONs to LSTs and LHAs.

8.5.6 Recommendations

Based on the results of this analysis, the following recommendations are made regarding MAU and MAB load planning:

- That logistics trailers be provided for all shelters involved in a MAU/MAB assault operation.
- That all modules and QUADCONs be mobile loaded.
- That operational testing requirements related to amphibious shipping and over the beach operations involving FLS equipment be identified.

8.6 COST ANALYSIS

In addition to the effectiveness analysis, a cost comparison was also performed for all FLS subsystems. The objective of this analysis was to obtain a comprehensive cost comparison of existing logistic support capabilities with that of the FLS.

The cost analysis involved a comparison of shelter, motor vehicle, material handling equipment, container, and service support costs for the existing logistic system and for the FLS. First, the total initial outfitting cost for each subsystem was tabulated. Life-cycle parameters were then included. This was accomplished by determining the number of rebuy cycles which would be required for each item over a 10-year period, summing up the 10-year totals by subsystem, and averaging to a yearly cost. Finally, estimates of annual training and maintenance costs were derived from data of existing training studies. All costs are expressed in terms of FY82 dollars.

8.6.1 Cost Analysis Parameters

The parameters used in the analysis were initial investment, maintenance, and training costs throughout the equipment life cycle. Other parameters which affect cost were held constant for both the FLS and the existing equipment. These include such influencing factors as equipment compatibility resulting from standardization, and technological modifications which improve performance, reliability, and space usage. FLS emphasizes standardization of items and thereby attains a significant decrease in the total number of equipment types. Prior studies have shown that standardization reduces the training required, increases dependability, simplifies maintenance, and improves availability. However, not enough data was readily available in these areas pertinent to the FLS for use in this evaluation.

8.6.2 Existing Equipment to be Replaced

Existing Shelters. Table 8-34, at the end of this chapter, lists all existing hard and soft shelters in the MAF which will be replaced by FLS shelters. These shelters include prefabricated buildings, trailer-mounted vans, semitrailers, truck-mounted units, and tents.

All are categorized under the heading of shelters since they will be replaced by FLS shelters. The TAM numbers associated with the items represent the totally configured module, including equipment. However, the costs used are for the shelters only.

Some FLS equipment has been included in the existing shelter tabulation. This is necessary since the MAF units lack certain equipment which is believed necessary to maintain their full operational capability. To overcome this shortage, either modifications would be required to the authorized allowance of existing equipment for individual unit Tables of Equipment (T/Es), or new shelters would be required. For the sake of costs comparison, it was expedient to add new shelters to both the existing logistic support system and the FLS to fill these requirements. In this way, the change in costs to both systems was constant.

The life cycle of each existing shelter is listed. All hard shelters have a 10-year life cycle and all soft shelters have a 2-year life cycle. These life cycles were obtained from the MCESS study.

Quantities for existing shelters were obtained by modifying those requirements contained in the MCESS Update Study to account for the inventory requirement differences stemming from the organizational variations between the notional MAF used in the MCESS study and the Mobilization Troop List presently used by MCDEC. This was done by determining which T/Es were included in the current force structure but not in the MCESS study and by adding an appropriate amount to the shelter quantity to provide for these differences. For T/Es included in the MCESS study but not in the current force structure, the appropriate amounts were subtracted. Costs for existing equipment were based on past procurements, industry estimates, or, in the case of shelters, the Marine Corps Expeditionary Shelter System Quantitative Requirements Analysis. In all cases, appropriate escalation factors were applied to arrive at FY82 costs.

Existing Motor Transport and Material Handling Equipment. Table 8-34 lists all motor transport and material handling equipment to be replaced by FLS equipment. The costs, quantities, and life cycles for this equipment were determined by the same methodology used to determine the data for shelters.

Existing Containers. The present logistic system consists of pallets, pallet boxes, and mount-out boxes. These items are shown in the existing equipment listing for containers in table 8-34, along with the number required and costs. The requirements were based on the analysis developed in the Containerization Requirements for the Fleet Marine Forces. It is important to note that the costs shown for existing containers in table 8-34 do not account for the labor required to build the pallet or box. The costs only reflect the quantities of the raw materials (lumber) required.

Existing Service Support Equipment. The existing service support equipment which will be replaced by FLS is shown in table 8-34.

8.6.3 FLS Equipment

FLS Shelters. The FLS shelters represent all of the new equipment which will be used to replace tents, prefab buildings, trailer-mounted vans, semitrailers, and truck-mounted units, as well as new shelters for which there is no comparable type of existing equipment.

The quantities of FLS shelters reflect modifications made to the MCESS Update Study. As previously indicated, the currently recognized force structure and the one used in the MCESS study are not the same. This variance was treated in the same manner for FLS shelters as it was for existing shelters.

These modifications ensure that the quantities for existing logistic support shelters and new FLS shelters represent the respective amounts of equipment required to provide full capability to the Marine Corps as it is currently structured.

FLS Motor Transport and Material Handling Equipment. Table 8-35, also at the end of this chapter, lists all FLS motor transport and material handling equipment. The methodology for determining costs, quantities, and life cycles for these items was similar to that used for shelters.

FLS Containers. The FLS container subsystem consists of PALCONs, PALCON racks, inserts, QUADCONs, QUADCON racks, shipping frames, and flatracks. These, along with their costs and quantities, are listed in table 8-35. The basic rationale for replacement was to provide an equivalent cube capacity, taking into account factors such as outsize equipment and density.

FLS Service Support Equipment. The service support subsystem includes the Marine Corps Environmental Controlled Medical System (MCEMS), fuel/water storage and pump modules, water purification units, soil stabilization units, firefighting modules, sanitation units, laundry and bath units, dump modules, Mobile Electrical Power Distribution Systems (MEPDIS), refrigeration units, food services systems, bridging, generators, air conditioners, engineer equipment, and bulk fuel systems.

Costs and quantities for individual units are listed in table 8-35. Rationale for determining costs and quantities is included in the Service Support section of appendix A.

8.6.4 Results of the Initial Cost Comparison

Table 8-36 summarizes the cost of buying all existing shelters, motor transport, material handling equipment, containers, and service support units required to support a MAF, using past procurement costs escalated in terms of FY82 dollars. The estimates for FLS equipment are also presented.

Table 8-36. Cost For Equipment Procurement
($ in millions)

	Existing	FLS
Shelter	181.4	514.3
Motor Vehicle	631.3	729.6
Material Handling Equipment	121.4	146.2
Container	4.1	63.1
Services Support	228.6	459.9
Totals	1,166.8	1,913.1

An examination of these figures shows a greater cost for FLS equipment. In the shelter subsystem, this increase is principally the result of replacing soft shelters (tents) with more durable hard shelters. Tents cost approximately $2 to $10 per square foot of enclosed area, while hard shelters cost about $100 a square foot. Motor transport savings, due to the reduced number of FLS vehicles, are offset because 5/4- and 5-ton trucks cost more than the older truck versions which they replace. It is worth emphasizing again, however, that procurement of some existing equipment listed in table 8-34 may no longer be possible.

In the material handling subsystem, cost increases are primarily due to the introduction of the LACH, the 30-ton crane, and the container handler.

The added cost in the container subsystem is the result of replacing relatively inexpensive mount-out boxes and pallets with more durable, but costly, PALCONs and QUADCONs. Another FLS container cost results from the new requirement for flatracks to transport the large shelters. However, the extended life cycles of the PALCONs and QUADCONs will offset some of this additional cost. Other cost savings will be realized through improved protection of the cargo carried in PALCONs and QUADCONs.

The increased cost in service support is primarily the result of introducing MCEMS, new units for firefighting and sanitation, and the requirement for additional generators and air conditioners to service the new shelters and service support modules.

8.6.5 Other Factors Impacting Cost

Life cycle, maintenance costs, training costs, and manpower requirements are factors which have a direct impact on the total system cost. Although precise data is not yet available on maintenance, manpower, and training costs, some approximations were made.

Life Cycle. An examination of the average yearly cost by subsystem over a 10-year period is shown in table 8-37 for FLS and the existing logistic system.

Table 8-37. Cost Per Year Over A 10-Year Period
($ in millions)

	Existing	FLS
Shelter	25.4	57.5
Motor Vehicle	83.8	73.0
Material Handling Equipment	20.6	20.8
Container	2.0	8.1
Services Support	30.4	56.3
Totals	162.2	215.7

These figures were obtained by adding the yearly costs for existing and FLS equipment over a 10-year period (see table 8-34 and 8-35) and dividing by 10.

Training and Maintenance Costs. Since FLS contains only one-third as many equipment types as the existing logistic support system, training costs for FLS should be significantly less than present equipment. However, only approximations can be made as to how much these training costs will be in terms of FY82 dollars.

Based on the FLS Manpower and Training Requirements Analysis, December 1980, costs for Marine Corps formal school training related to all existing logistic support equipment identified in table 8-34 is approximately $13 million per year. The analysis indicates that FLS will provide a net annual reduction in training costs of $1.3 million. These results are presented in table 8-34.

For maintenance, the MCESS study estimates that costs for present shelter equipment are 7 percent of the equipment's initial cost each year. For FLS equipment, the estimate by the MCESS study is 3 percent per year. On a yearly basis, this adds $12.7 million to the cost of existing shelters and $15.4 million to FLS shelters.

Maintenance costs for motor transport and MHE are expected to be higher because more moving parts are involved. However, significant savings in maintenance costs should be realized for FLS equipment over existing equipment resulting from the reduced range of spare parts and fewer personnel required by the FLS. The CVM study estimates 25 percent less maintenance costs for FLS motor transport. Assuming a maintenance rate of 10 percent of initial cost each year on existing equipment, the yearly cost to maintain existing motor transport equipment would equal $63.1 million. Using 7.5 percent of initial cost each year on FLS equipment, the yearly maintenance cost for FLS motor transport equipment is estimated to be $54.7 million.

On a yearly average, training and maintenance costs will add $88.8 million to the existing logistic system and $81.8 million to FLS. Adding these yearly training and maintenance costs to the costs in table 8-37 gives the results shown in table 8-38.

8.7 COST COMPARISON RESULTS

As table 8-38 indicates, over a 10-year period the average yearly cost for FLS will be higher than the average yearly cost of the existing equipment. The difference is approximately $46.5 million per year.

Table 8-38. Yearly Costs Including Life Cycle, Training, and Maintenance ($ in millions)

	Existing	FLS
Shelter	25.4	57.5
Motor Vehicle	83.8	73.0
Material Handling Equipment	20.6	20.8
Container	2.0	8.1
Services Support	30.4	56.3
Maintenance	75.8	70.1
Training	13.0	11.7
Totals	251.0	297.5

8.8 CONCLUSIONS

Based on the system effectiveness analysis of both FLS and the existing logistic system, as well as the cost comparison of all FLS equipment and existing equipment over a 10-year period, FLS is considered to be a superior logistic system.

FLS requires less square-loading capacity on amphibious ships, fewer unit loads, less manpower, less landing craft, and provides throughput rates equal to the existing logistic system.

Although the initial procurement cost for the entire FLS exceeds the current system procurement costs by approximately 64 percent, based on projected cost estimates, the Marine Corps capability to cope with containerized material using current equipments is severely limited. In addition, this 64-percent difference is the result of escalating past procurement costs for existing equipment in terms of FY82 dollars. Furthermore, this comparison indicates that, based on potential savings related to extended life cycles and reduced maintenance and training costs, the cost differential may be significantly less than indicated in table 8-38.

8.9 FOLLOW-ON EFFORTS

As a result of analyzing the validity of the FLS concept, certain areas of future investigation are recommended.

Simulation results indicate that a detailed analysis of motor transport and material handling equipment requirements for ANSI/ISO containers, shelters, and modules is war-

ranted. This is suggested to ascertain possible modifications in T/E distributions and quantities. Additionally, a detailed simulation with equipment/personnel casualties, weather fluctuations, sea state variables, and AOA geographical variables is recommended.

Based on the load-out analyses, prototype testing is essential to validate the capabilities for arranging and handling PALCONs and QUADCONs on amphibious ships, for transporting QUADCONs in 5-ton trucks, and for towing shelters mounted on trailers with respect to loading and offloading lighterage in the AE.

Continuing manpower and training analysis is deemed essential as changes to FLS elements will alter equipment allowances and missions of affected units.

Table 8-34. USMC Existing Equipment Data Storage File

USMC FLS DATA STORAGE FILE

COSTS TO PROCURE EXISTING LOGISTIC SHELTERS, MOTOR VEHICLES, MATERIAL HANDLING EQUIPMENT, CONTAINERS, AND SERVICE SUPPORT EQUIPMENT FOR INVENTORY OBJECTIVE OVER A 10 YEAR PERIOD USING FY82 PRICES

SHELTERS

ITEM#	DESCRIPTION		UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
A0010	AIRBRN MPL D AIR SUPT	AN/UYQ-3	9509	8	10	76	0	0	0	0	0	0	0	0	0
A0023	AIR CONTROL CENTRAL	AN/TYQ-1	66670	6	10	400	0	0	0	0	0	0	0	0	0
A0060	AIR SUPT RDR COMM	AN/TPA-9	9835	21	10	206	0	0	0	0	0	0	0	0	0
A0175	CALIBR CMPL TRANSPL	AN/TSM-119	62650	16	10	1002	0	0	0	0	0	0	0	0	0
A0177	CALIBR SHOP TRANSPL	AN/TSM-124	8645	5	10	43	0	0	0	0	0	0	0	0	0
A0240	CTRL OFF. TELEPHONE	AN/MTC-1	17722	9	10	159	0	0	0	0	0	0	0	0	0
A0246	CTRL OFF TELPH	AN/TTC-38(V) 1	19020	4	10	76	0	0	0	0	0	0	0	0	0
A0268	COMM CTRL	AN/TGC-37	45397	32	10	1452	0	0	0	0	0	0	0	0	0
A0270	COMM CTRL	AN/TSC-15	4815	179	10	861	0	0	0	0	0	0	0	0	0
A0280	COMM CTRL , UHF	AN/TYA-11	8645	39	10	337	0	0	0	0	0	0	0	0	0
A0437	DATA COMM TERMINAL	AN/TYC-5A	12445	24	10	298	0	0	0	0	0	0	0	0	0
A0540	DIR FNDNG PLOT FAC.	AN/TSQ-52	6810	2	10	13	0	0	0	0	0	0	0	0	0
A0860	INTRCPT FAC,HEAVY	AN/TSQ-54A	11240	8	10	89	0	0	0	0	0	0	0	0	0
A0865	LGHT INTRCPT FACTY	AN/TSQ-103	5637	8	10	45	0	0	0	0	0	0	0	0	0
A1111	OPERATIONS CTRL	AN/TSQ-6A	15500	7	10	108	0	0	0	0	0	0	0	0	0
A1350	PDR,CRSE DIRCT CTRL	AN/TPQ-10	5166	18	10	92	0	0	0	0	0	0	0	0	0
A1435	RADAR SET	AN/TPQ-31	8645	9	10	77	0	0	0	0	0	0	0	0	0
A1460	RADAR SET	AN/TPS-22D	50290	10	10	502	0	0	0	0	0	0	0	0	0
A1470	RADAR SET	AN/TPS-32	22595	13	10	295	0	0	0	0	0	0	0	0	0
A1500	RADAR SET LWT.A.CTRL	AN/TPS-63	8645	30	10	259	0	0	0	0	0	0	0	0	0

Table 8-34. USMC Existing Equipment Data Storage File (Continued)

ITEM#	DESCRIPTION		UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
A1505	RADAR SET	AN/UPS-1B	8645	12	10	103	0	0	0	0	0	0	0	0	0
A2090	RADIO SET, 12 CHAN	AN/TRC-97C	4697	75	10	352	0	0	0	0	0	0	0	0	0
A2091	RADIO SET, 24 CHAN	AN/TRC-97E	4697	39	10	183	0	0	0	0	0	0	0	0	0
A2310	SHELTER, ELEC EQUIP	S-126A/G	9618	60	10	577	0	0	0	0	0	0	0	0	0
A2320	SHELTER,MAINT. SUPT	AN/GRM-86	9509	260	10	2472	0	0	0	0	0	0	0	0	0
A2340	SHOP, ELECTRONIC	AN/GRM-32B	9509	66	10	627	0	0	0	0	0	0	0	0	0
A2350	SHOP, ELECTRONIC	AN/GRM-38A	9509	58	10	551	0	0	0	0	0	0	0	0	0
A2360	SHOP, ELECTRONIC	AN/GRM-82	9509	5	10	47	0	0	0	0	0	0	0	0	0
A2362	SHOP, ELEC. MAINT.	AN/GRM-98	9509	23	10	218	0	0	0	0	0	0	0	0	0
A2392	SIG. MON. FAC. LIGHT	AN/TSQ-88V	4697	10	10	46	0	0	0	0	0	0	0	0	0
A2394	SIG. MON. FACILITY	AN/TQS-89	11992	4	10	47	0	0	0	0	0	0	0	0	0
A2530	TACT. AIR OP. CTRL	AN/TYQ-2	353416	14	10	4947	0	0	0	0	0	0	0	0	0
A2540	TACT. DATA COMM CTRL	AN/TYQ-3	35553	20	10	711	0	0	0	0	0	0	0	0	0
A2682	TELEPHONE TERMINAL	AN/TCC-72	5519	121	10	667	0	0	0	0	0	0	0	0	0
A2695	TEST INST. REPAIR	AN/GRM-104	51913	8	10	415	0	0	0	0	0	0	0	0	0
A3230	XLATOR XCPIBFF FAC	AN/TSQ-68	8336	2	10	16	0	0	0	0	0	0	0	0	0
B1200	IMAGERY INTER. MODULE	AN/TSQ-82	46725	4	10	186	0	0	0	0	0	0	0	0	0
B1293	L.WT. REPRO FAC MAP DIV		30265	5	10	151	0	0	0	0	0	0	0	0	0
B1312	MAP. SET, TRLR-MTD,TOPOGRAPHIC		60386	2	10	120	0	0	0	0	0	0	0	0	0
B1330	MOD RELOC BLDG,PREFAB		525689	8	10	4205	0	0	0	0	0	0	0	0	0
B1455	PHOTO. SYS. COMBAT NONAERIAL		73428	4	10	293	0	0	0	0	0	0	0	0	0
B1755	REPRO. EQUIP., TRLR-MTD, TOPO.		75723	10	10	757	0	0	0	0	0	0	0	0	0
B1940	SHOP EQUIP,TRK MTD	3ANVC6217	15273	55	10	840	0	0	0	0	0	0	0	0	0

Table 8-34. USMC Existing Equipment Data Storage File (Continued)

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
B1950	SHOP EQUIP.,GEN. PUR. SGPRSM	27009	18	10	486	0	0	0	0	0	0	0	0	0
B1960	SHOP EQUIP.ORGNZNL L.TRK.	13448	21	10	282	0	0	0	0	0	0	0	0	0
C5390	TENT, COMMAND POST M1945	778	847	2	658	0	658	0	658	0	658	0	658	0
C6400	TENT, FRAME TYPE, MAINT. MED.	8162	94	2	767	0	767	0	767	0	767	0	767	0
C6410	TENT,GEN PURPOSE,MED	1334	10519	2	14032	0	14032	0	14032	0	14032	0	14032	0
C6420	TENT,MAINTEN,SHELTER TYPE	2026	1369	2	2773	0	2773	0	2773	0	2773	0	2773	0
D0270	SEMI-TRLR, REPAIR,6-T, M750	44898	61	10	2738	0	0	0	0	0	0	0	0	0
D0290	SEMI-TRLR, 6-T, 4-WHEEL, M313	40588	95	10	3855	0	0	0	0	0	0	0	0	0
D0310	SHOP SET, FM, AUTO BASIC	80044	33	10	2641	0	0	0	0	0	0	0	0	0
D0320	SHOP SET, FM, AUTO., FUEL & ELE	22880	26	10	594	0	0	0	0	0	0	0	0	0
D0330	SHOP SET, FM, FUEL & F M-109A3	20500	15	10	307	0	0	0	0	0	0	0	0	0
D0340	SHOP SET, FM,FUEL & ELEC SYS	36116	20	10	722	0	0	0	0	0	0	0	0	0
D0350	SHOP SET, FM, AUTO, SUPP NO.1	38939	19	10	739	0	0	0	0	0	0	0	0	0
D0360	SHOP SET, FM, AUTO, SUPP NO.2	114458	18	10	2060	0	0	0	0	0	0	0	0	0
E0561	G. MSL BATTERY CTRL AN/TSW-8	47835	17	10	813	0	0	0	0	0	0	0	0	0
E0697	INF. PLTN COMM POST AN/MSW-11	29476	15	10	442	0	0	0	0	0	0	0	0	0
E0700	INF COORD CNT -HAWK- AN/MSQ-95	29476	16	10	471	0	0	0	0	0	0	0	0	0
E1038	MSL MAINT SHOP. AN/GSM-216	25574	17	10	434	0	0	0	0	0	0	0	0	0
E1160	OP CNT -HAWK- AN/TSQ-39	8336	8	10	66	0	0	0	0	0	0	0	0	0
E1600	SHOP EQUIP #5, FM, XPORT., XM2	47835	6	10	287	0	0	0	0	0	0	0	0	0
E1642	SHOP EQUIP, R. CTRL 3AN/TSM-104	47835	5	10	239	0	0	0	0	0	0	0	0	0
E1646	SHOP EQUIP, R. CTRL AN/TSM-106	47835	5	10	239	0	0	0	0	0	0	0	0	0
E1648	SHOP EQUIP, R. CTRL 9AN/TSM-107	47835	5	10	239	0	0	0	0	0	0	0	0	0

Table 8-34. USMC Existing Equipment Data Storage File (Continued)

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
E1660	SHOP SET, FM, 1 VAN, M109A3	9153	18	10	164	0	0	0	0	0	0	0	0	0
E1680	SHOP SET, MACHINE BASIC	14465	27	10	390	0	0	0	0	0	0	0	0	0
E1710	SHOP SET,FM, MOBILE ARTY,	9153	18	10	164	0	0	0	0	0	0	0	0	0
E1722	SHOP SET, FM, SMALL ARMS	9153	22	10	201	0	0	0	0	0	0	0	0	0
E1730	SHOP SET, FM, WELDING	14476	18	10	260	0	0	0	0	0	0	0	0	0
E1791	SIMULATOR STA. RDR AN/TPQ-29	47835	5	10	239	0	0	0	0	0	0	0	0	0
XXXX1	MOBILE MAINT FACILITY	18357	1334	10	24488	0	0	0	0	0	0	0	0	0
XXXX2	SHELTER & HANDLING AE-99-K-1	12808	206	10	2638	0	0	0	0	0	0	0	0	0
Q0900	RDR SET, AN/TSQ-107	19211	14	10	268	0	0	0	0	0	0	0	0	0
Q0909	RADIO SET, TACAN, AN/TRN-29	12680	14	10	177	0	0	0	0	0	0	0	0	0
Q0911	UHF BEACON RADIO SET, AN/TRN-33	12738	14	10	178	0	0	0	0	0	0	0	0	0
Q0920	AIR TRAFFIC CTRL TWR AN/TSA-28A	23759	14	10	332	0	0	0	0	0	0	0	0	0
Q0930	GCA APPCH., CTRL CNT AN/TSQ-18A	41152	14	10	576	0	0	0	0	0	0	0	0	0
Q0945	MAINT FACILITY AN/TSM-98	38422	14	10	537	0	0	0	0	0	0	0	0	0
	8*8*10 E	26300	20	10	526	0	0	0	0	0	0	0	0	0
	8*8*20 E	36200	84	10	3040	0	0	0	0	0	0	0	0	0
	8*8*20 R	30700	288	10	8841	0	0	0	0	0	0	0	0	0
	8*8*20 K	28400	1112	10	31580	0	0	0	0	0	0	0	0	0
	20*33	20800	164	10	3411	0	0	0	0	0	0	0	0	0
	32*73	59600	120	10	7152	0	0	0	0	0	0	0	0	0
	60*128	175800	184	10	32347	0	0	0	0	0	0	0	0	0
	JOINER CORRIDOR	22700	136	10	3087	0	0	0	0	0	0	0	0	0
	SHELTER COSTS				191401	0	18230	0	18230	0	18230	0	18230	0

Table 8-34. USMC Existing Equipment Data Storage File (Continued)

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
D0080	CHASSIS,TRLR, 3.5-T, 4-WH M353	5127	1685	12	8638	0	0	0	0	0	0	0	0	0
D0090	STM. PRESS. JET CLN, TRLR JOH-1	6819	394	10	2686	0	0	0	0	0	0	0	0	0
D0110	DOLLY TRLR, 6-T 2-WH CON M197A1	7256	523	25	3794	0	0	0	0	0	0	0	0	0
D0120	DOLLY TRLR, 8-T 2-WH CON M198A1	3353	241	12	808	0	0	0	0	0	0	0	0	0
D0130	DOLLY TRLR, 15-T CONV. M354	4894	39	16	190	0	0	0	0	0	0	0	0	0
D0190	LUB. &SERV. U., 2.5-T, TRLR-MTD	20354	308	14	6269	0	0	0	0	0	0	0	0	0
D0220	SEMI-TRLR, 65-T, H. EQUIP. M793	43114	17	15	732	0	0	0	0	0	0	0	0	0
D0230	SEMI-TRLR 25-T L. BED, M172A1	31190	101	15	3150	0	0	0	0	0	0	0	0	0
D0235	SEMITRLR,LOWBED,40T M870	24470	77	6	1884	0	0	0	0	0	1884	0	0	0
D0250	SEMI-TRLR,6T,2WH M118A1	23305	461	25	10743	0	0	0	0	0	0	0	0	0
D0260	SEMI-TRLR 12T 4WH M127A2C	23305	733	25	17082	0	0	0	0	0	0	0	0	0
D0300	SEMI-TRLR, VAN, REFRIG. M348A4	69914	28	25	1957	0	0	0	0	0	0	0	0	0
D0840	AMPHIB CARGO TRLR, .25-T, M416	1029	4884	12	5025	0	0	0	0	0	0	0	0	0
D0850	.75-T 2-WHL CARGO TRLR M101A1	1818	411	12	747	0	0	0	0	0	0	0	0	0
D0860	1.5-T 2-WHL CARGO TRLR M105A2	2409	2735	20	6588	0	0	0	0	0	0	0	0	0
D0875	.75-T 2-WHL FLTRED TRLR M762	1748	1493	12	2609	0	0	0	0	0	0	0	0	0
D0885	2.5-T 4-WHL UTILITY TRLR	15174	139	14	2109	0	0	0	0	0	0	0	0	0
D0890	.25-T 4X4 AMBUL. TRK M718A1	13241	401	8	5309	0	0	0	0	0	0	0	5309	0
D0915	1.75-T 4X4 AMBUL. TRK M886	13253	178	3	2359	0	0	0	0	0	0	0	2359	0

Table 8-34. USMC Existing Equipment Data Storage File (Continued)

ITEM#	DESCRIPTION		UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
D1000	1.25-T 6X6 AMBUL. TRK	M790	16225	90	16	1460	0	0	0	0	0	0	0	0	0
D1015	1.25-T 4X4 CARGO TRK	M880	11427	1358	8	15517	0	0	0	0	0	0	0	15517	0
D1020	1.25-T 6X6 W/WINCH CRG TRK	M561	44000	1027	8	45188	0	0	0	0	0	0	0	45188	0
D1030	2.5-T14X6 CRG TRK DRPSID	M35A2C	35663	2677	14	95469	0	0	0	0	0	0	0	0	0
D1040	2.5-T CRG TRK, W/OW, W/E,	M36A2	29889	278	14	8309	0	0	0	0	0	0	0	0	0
D1050	5-T 6X6 CRG TRK,	M54A2C	41478	2565	16	106391	0	0	0	0	0	0	0	0	0
D1060	5-T 6X6 CRG TRK	M55A2	62543	20	16	1250	0	0	0	0	0	0	0	0	0
D1084	TRUCK,FIREFIGHTING,BRUSH	M530CB	35554	77	6	2737	0	0	0	0	0	2737	0	0	0
D1085	TRUCK,FIREFIGHTING,STRUCT	M530CS	40264	14	6	563	0	0	0	0	0	563	0	0	0
D1091	TRUCK,TELE ULT CONSTRUCT	M876	116445	25	14	2911	0	0	0	0	0	0	0	0	0
D1095	TRUCK,OIL SERV,ARCFT,2.5T,500G		15148	9	14	136	0	0	0	0	0	0	0	0	0
D1130	TRUCK,TRCTR,5T,W/O WINCH	M52A2	64300	791	16	50861	0	0	0	0	0	0	0	0	0
D1140	TRUCK,TRCTR,10T,6X6	M123A1C	88067	151	10	13298	0	0	0	0	0	0	0	0	0
D1143	TRUCK,TRCTR,10T,6X6	M123E2	83007	25	10	2075	0	0	0	0	0	0	0	0	0
D1155	TRUCK,.25T,JEEP-GM	M152-A2	10868	808	8	8781	0	0	0	0	0	0	0	8781	0
D1156	TRUCK,.25T,GM CARRIER	M152-A2	10868	401	8	4358	0	0	0	0	0	0	0	4358	0
D1160	TRUCK,ULTILITY,.25T,4X4	M152-A2	10868	11051	8	120102	0	0	0	0	0	0	0	120102	0
D1190	TRUCK, VAN, TRLR-MTD		32626	301	10	9820	0	0	0	0	0	0	0	0	0
D1210	TRUCK,WRECKER,5T,6X6	M543A2	176841	336	16	59418	0	0	0	0	0	0	0	0	0
	MOTOR VEHICLE COSTS					631323	0	0	0	0	0	5184	0	201614	0

Table 8-34. USMC Existing Equipment Data Storage File (Continued)

MATERIAL HANDLING

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	1	2	3	4	5	6	7	8	9	10
B0410	CRANE-SHOVEL, CRWLR-MTD M-62	104288	65	10	6778	0	0	0	0	0	0	0	0	0
B0435	CRANE,TRUCK-MTD,15-T M-315-T	124680	90	9	11221	0	0	0	0	0	0	0	11221	0
B2465	TRACTOR, RT ARTICLATED STEER	125400	364	7	45645	0	0	0	0	0	0	45645	0	0
B2565	TRK, FRKLFT, RGH TERRN MC-4000	43000	385	7	16555	0	0	0	0	0	0	16555	0	0
B2560	TRK, FRKLFT,6000LB 05-3354	77600	531	10	41205	0	0	0	0	0	0	0	0	0
	MATERIAL HANDLING COSTS				121404	0	0	0	0	0	0	62200	11221	0

CONTAINERS

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	1	2	3	4	5	6	7	8	9	10
	BOX PALLET 32*40	31	27048	2	838	0	838	0	838	0	838	0	838	0
	FLAT PALLET 32*40	8	7424	2	59	0	59	0	59	0	59	0	59	0
	BOX PALLET 40*48	54	33736	2	1822	0	1822	0	1822	0	1822	0	1822	0
	FLAT PALLET 40*48	12	20000	2	240	0	240	0	240	0	240	0	240	0
	FLAT PALLET 40*48	12	20844	2	250	0	250	0	250	0	250	0	250	0
	MOUNT OUT BOX	20	20000	2	400	0	400	0	400	0	400	0	400	0
	MOUNT OUT BOX	20	24544	2	490	0	490	0	490	0	490	0	490	0
	CONTAINER COSTS				4099	0	4099	0	4099	0	4099	0	4099	0

SERVICE SUPPORT

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	1	2	3	4	5	6	7	8	9	10
D0215	SEMI-TRLR, 4-WH 5000-TON M857	50334	287	16	14445	0	0	0	0	0	0	0	0	0
D0880	400GAL H2O TANK TRLR M149A1	3506	1334	14	4677	0	0	0	0	0	0	0	0	0
D1110	TRUCK,TANK,FUEL,1200G,2.5M49A2C	29889	406	14	12134	0	0	0	0	0	0	0	0	0
D1120	TRUCK,TANK,WATER,1000G M50A2	29763	163	14	4851	0	0	0	0	0	0	0	0	0
B2385	WATER PURIF,ERDAL,1500GPH	26800	38	8	1018	0	0	0	0	0	0	0	1018	0

Table 8-34. USMC Existing Equipment Data Storage File (Continued)

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
B2620	WATER PURIF,ERDAL,600GPH,TM	12002	96	5	1152	0	0	0	0	0	1152	0	0	0
B2565	WATER PURIF,ERDAL,1500GPH,FM	9205	405	10	3728	0	0	0	0	0	0	0	0	0
U3080	DISTIL UNIT,200GPH,TR MTD	8623	175	10	1509	0	0	0	0	0	0	0	0	0
B1220	MOMAT ASSAULT TRACKWAY KIT	3781	1792	1	6775	6775	6775	6775	6775	6775	6775	6775	6775	6775
D1060	.25-T 4X4 FIREFGT. TRK MC1051	8231	98	8	806	0	0	0	0	0	0	0	806	0
B1225	LAUNDRY UNIT	31694	192	9	6095	0	0	0	0	0	0	0	6085	0
B0060	BATH UNIT	18828	264	9	4970	0	0	0	0	0	0	0	0	4970
D1070	5-T DUMP TRK. 6X6, M51A2	91404	718	13	65628	0	0	0	0	0	0	0	0	0
B1650	REFRIG UNIT,100 CU FT	2214	653	10	1445	0	0	0	0	0	0	0	0	0
B1660	REFRIG UNIT,630 CU FT	2447	317	10	775	0	0	0	0	0	0	0	0	0
B1690	REFFIG,PREFAB,100 CU FT	5826	653	10	3804	0	0	0	0	0	0	0	0	0
B1700	REFFIG,PREFAB,630 CU FT	10487	284	10	2978	0	0	0	0	0	0	0	0	0
B0140	BRIDGE,FIXED HIGHWAY	737965	14	10	10331	0	0	0	0	0	0	0	0	0
B0150	BRIDGE,FIXED FLOATING 1	540630	25	10	13515	0	0	0	0	0	0	0	0	0
C4130	BAKERY PLANT TRLR MTD	381150	7	10	2668	0	0	0	0	0	0	0	0	0
B1920	SCRAPER,TOWED,8CUYD	28958	58	10	1679	0	0	0	0	0	0	0	0	0
B2462	TRACTOR,CHLP	130000	271	10	35230	0	0	0	0	0	0	0	0	0
D1090	LUB SERVICE UNIT	25900	300	10	7770	0	0	0	0	0	0	0	0	0
D0090	STEAM CLEANER	6970	394	10	2746	0	0	0	0	0	0	0	0	0
B0685	AAFS 1	60000	49	10	2940	0	0	0	0	0	0	0	0	0
B0675	TAFDS	139000	81	10	11259	0	0	0	0	0	0	0	0	0
B1135	HERS	50000	73	10	3650	0	0	0	0	0	0	0	0	0
	SERVICE SUPPORT COSTS				228568	6775	6775	6775	6775	6775	7927	6775	14684	11745
	TOTAL COSTS				1166795	6775	29104	6775	29104	6775	35440	68975	249848	11745

Table 8-35. USMC FLS Data Storage File

COSTS TO PROCURE NEW FLS SHELTERS,
MOTOR VEHICLES, MATERIAL HANDLING EQUIPMENT,
CONTAINERS, AND SERVICE SUPPORT EQUIPMENT
FOR INVENTORY OBJECTIVE - OVER A 10 YEAR PERIOD
USING FY82 PRICES

SHELTERS

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
A0023	AIR CONTROL CENTRAL AN/TYQ-1	66670	4	10	266	0	0	0	0	0	0	0	0	0
B1330	MOD RELOC BLDG, PREFAB	525690	4	10	2102	0	0	0	0	0	0	0	0	0
B1940	SHOP EQUIP TRK MTD 3ANVC6217	15275	44	10	672	0	0	0	0	0	0	0	0	0
C6390	TENT COMMAND POST M1945	778	2080	1	1618	1618	1618	1618	1618	1618	1618	1618	1618	1618
C6410	TENT GENERAL PURPOSE MEDIUM	1335	3452	1	4608	4608	4608	4608	4608	4608	4608	4608	4608	4608
C6420	TENT,MAINTENANCE,SHELTER TYPE	2035	244	1	496	496	496	496	496	496	496	496	496	496
C6440	TEXTILE REPAIR SHOP TRLR MTD	8815	8	10	70	0	0	0	0	0	0	0	0	0
E1670	SHOP SET,FM,CONTACT AND EMERG	8675	20	10	173	0	0	0	0	0	0	0	0	0
Q0920	AIR TRAFFIC CONTROL AN/TSA-28A	95035	16	10	1520	0	0	0	0	0	0	0	0	0
Q0925	AIR TRAFFIC CONTROL AN/TRC-131	26590	16	10	425	0	0	0	0	0	0	0	0	0
	8*8*10 E	26300	1009	10	26536	0	0	0	0	0	0	0	0	0
	8*8*20 E	36200	297	10	10751	0	0	0	0	0	0	0	0	0
	8*8*20 R	30700	4979	10	152855	0	0	0	0	0	0	0	0	0
	8*8*20 K	28400	6315	10	179346	0	0	0	0	0	0	0	0	0
	20*33	20800	639	10	13291	0	0	0	0	0	0	0	0	0
	32*73	59600	369	10	21992	0	0	0	0	0	0	0	0	0
	60*128	175800	214	10	37621	0	0	0	0	0	0	0	0	0
	JOINER CORRIDORS	22700	2640	10	59928	0	0	0	0	0	0	0	0	0
	SHELTER COSTS				514270	6722	6722	6722	6722	6722	6722	6722	6722	6722

Table 8-35. USMC FLS Data Storage File (Continued)

MOTOR VEHICLES

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
DXX15	1.25TON, LIGHT TACTICAL	22000	12651	10	278322	0	0	0	0	0	0	0	0	0
DXX16	5 TON CARGO TRK	61200	4985	10	305082	0	0	0	0	0	0	0	0	0
	5 TON WRECKER	106300	274	10	29126	0	0	0	0	0	0	0	0	0
DXX17	MEDIUMTRACTOR	58800	553	10	32516	0	0	0	0	0	0	0	0	0
DXX18	LARGETRACTOR	100000	530	10	53000	0	0	0	0	0	0	0	0	0
DXX19	12.5 TON TRAILER	13600	1058	10	14388	0	0	0	0	0	0	0	0	0
DXX22	22.5 TON TRAILER	18900	764	10	14439	0	0	0	0	0	0	0	0	0
DXX23	MOBILIZER/TRANSPORTER	15000	121	10	1815	0	0	0	0	0	0	0	0	0
DXX65	65 TON TRAILER	52500	17	10	892	0	0	0	0	0	0	0	0	0
	MOTOR VEHICLE COSTS				729580	0	0	0	0	0	0	0	0	0

MATERIAL HANDLING EQUIPMENT

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
B0399	CRANE TRK MTD RT 30T	179200	173	10	31001	0	0	0	0	0	0	0	0	0
E2465	TRACTOR,RT 10000K ART STEER	125400	364	7	45645	0	0	0	0	0	0	45645	0	0
B2565	TRK, FRKLFT, RGH TERRN MC-4000	43000	385	7	16555	0	0	0	0	0	0	16555	0	0
B2560	TRK, FRKLFT, RGH TERRN 05-3354	77600	531	10	41205	0	0	0	0	0	0	0	0	0
U3069	LACH	108900	57	10	6207	0	0	0	0	0	0	0	0	0
	CONTAINER HANDLER	224900	25	10	5622	0	0	0	0	0	0	0	0	0
	MATERIAL HANDLING COSTS				146235	0	0	0	0	0	0	62200	0	0

Table 8-35. USMC FLS Data Storage File (Continued)

CONTAINERS

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
	PALCON	623	24445	5	15229	0	0	0	0	15229	0	0	0	0
	PALCON RACK	68	2974	5	202	0	0	0	0	202	0	0	0	0
	INSERT	50	22622	5	1131	0	0	0	0	1131	0	0	0	0
	INSERT	50	20000	5	1000	0	0	0	0	1000	0	0	0	0
	QUADCON	2494	11520	10	28730	0	0	0	0	0	0	0	0	0
	QUADCON RACK	347	506	10	175	0	0	0	0	0	0	0	0	0
	FLATRACK 20'	6059	1804	10	10930	0	0	0	0	0	0	0	0	0
	FLATRACK 40'	7224	789	10	5699	0	0	0	0	0	0	0	0	0
	CONTAINER COSTS				63096	0	0	0	0	17562	0	0	0	0

SERVICE SUPPORT

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
	MCEMS	7000000	4	10	28000	0	0	0	0	0	0	0	0	0
E2085	FUEL/WATER MODULE	7600	2902	10	22055	0	0	0	0	0	0	0	0	0
B1580	FUEL PUMP MODULE	7500	370	10	2775	0	0	0	0	0	0	0	0	0
B2604	WATER PURIFICATION UNIT	125000	615	10	76875	0	0	0	0	0	0	0	0	0
B2090	SOIL STABILIZATION	107000	33	8	3531	0	0	0	0	0	0	0	3531	0
	FIREFIGHTING EQUIPMENT	32000	163	8	5216	0	0	0	0	0	0	0	5216	0
	SANITATION UNIT	6300	1866	10	11755	0	0	0	0	0	0	0	0	0
	LAUNDRY BATH UNIT	136000	58	10	7888	0	0	0	0	0	0	0	0	0
	DUMP MODULE	11450	257	10	2942	0	0	0	0	0	0	0	0	0
B1645	REFRIGERATION UNIT	28000	684	10	19152	0	0	0	0	0	0	0	0	0
	MEPDIS	121875	52	10	6337	0	0	0	0	0	0	0	0	0

Table 8-35. USMC FLS Data Storage File (Continued)

ITEM#	DESCRIPTION	UNIT COST	INV OBJ	LIFE CYCLE	YEAR - COSTS IN $1000S 1	2	3	4	5	6	7	8	9	10
B0003	AC,60 HZ,18000 BTU,VERT	5570	3187	7	17751	0	0	0	0	0	0	17751	0	0
B0005	AC,60 HZ,36000 BTU,VERT	6752	2251	7	15198	0	0	0	0	0	0	15198	0	0
B0011	AC,60 HZ,54000 BTU,VERT	9529	647	4	6165	0	0	0	6165	0	0	0	6165	0
B0731	GEN SET,3 KW,60 HZ	5428	702	7	3810	0	0	0	0	0	0	3810	0	0
B0891	GEN SET, 7 KW,60 HZ	11200	260	7	2912	0	0	0	0	0	0	2912	0	0
B0953	GEN SET,30 KW,60 HZ	14549	271	7	3942	0	0	0	0	0	0	3942	0	0
B1021	GEN SET,60 KW,60 HZ	18400	738	7	13579	0	0	0	0	0	0	13579	0	0
B1045	GEN SET,100 KW,60 HZ	43478	493	7	21434	0	0	0	0	0	0	21434	0	0
B1050	GEN SET,200 KW,60 HZ	50725	67	7	3398	0	0	0	0	0	0	3398	0	0
B0152	MEDIUM GIRDER BRIDGE	692000	37	10	25604	0	0	0	0	0	0	0	0	0
	BULK LAUNDRY	32700	191	10	6245	0	0	0	0	0	0	0	0	0
	BATH/SHOWER UNIT	19600	168	10	3292	0	0	0	0	0	0	0	0	0
	FIELD FEEDING SYSTEM	189000	135	10	25515	0	0	0	0	0	0	0	0	0
	BAKERY SYSTEM	816000	5	10	4080	0	0	0	0	0	0	0	0	0
	SCRAPER	131400	83	10	10906	0	0	0	0	0	0	0	0	0
B2462	TRACTER,CRAWLER	130000	271	10	35230	0	0	0	0	0	0	0	0	0
B1090	LUB SERVICE UNIT	25900	300	10	7770	0	0	0	0	0	0	0	0	0
D0090	STEAM CLEANER	6400	389	10	2489	0	0	0	0	0	0	0	0	0
B0685	AAFS	1060000	46	10	48760	0	0	0	0	0	0	0	0	0
B0675	TAFDS	139000	83	10	11537	0	0	0	0	0	0	0	0	0
B1135	HERS	50000	75	10	3750	0	0	0	0	0	0	0	0	0
	SERVICE SUPPORT COSTS				459893	0	0	0	6165	0	0	82024	14912	0
	TOTAL COSTS				1913074	6722	6722	6722	12887	24284	6722	150946	21634	6722

CHAPTER 9

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